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Gregory Louis Kerry Francis Carter

Deep into that darkness, peering: A series of studies on the Dark Triad of personality

Abstract

This submission spans my work undertaken over the course of recent years on sub-clinical narcissism, Machiavellianism, and sub-clinical psychopathy: The Dark Triad of personality. Across this thesis, I present a series of published and unpublished materials that cover these overlapping yet distinct personality traits in relation to their attractiveness to women, short- and long-term mating preferences, broader personality and lifestyle correlates, general and sexual competitiveness (in women), verbal and non-verbal behavioural outcomes in a mate-attraction scenario, and health-related behaviours and longevity. I also apply a form of scale analysis to establish how well these traits are measured across sex and age groups by a short inventory that has seen widespread use in the field. Broadly, I consider these issues against a backdrop of evolutionary psychology, individual differences in personality, sex- and age-related differences, and the perception and measurement of personality traits. Specifically, I consider the need to look beyond self-reports, especially when over-claiming is a serious risk, to simultaneously evaluate sex similarities, as well as sex differences, to develop an understanding of the particular behaviours that are demonstrated by individuals with personalities associated with higher levels of mating success, and the need to subject inventories to rigorous scrutiny, across both classical, and item response testing. In each chapter, I have sought to contribute to the on-going discussions that researchers active in this field are engaged with regarding the future of this rapidly-advancing area of study. Interest in this personality constellation shows no sign of abating – its rise to prominence within evolutionary and personality psychology to date has been swift – and I conclude with thoughts and suggestions as to which areas future research could explore in order to further our understanding of the Dark Triad.

Deep into that darkness, peering: A series of studies on the Dark Triad of personality

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Submitted for the qualification Doctor of Philosophy

Psychology Department

University of Durham



2015

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Statement of copyright

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For Katherine;

For Louis

Preface

From the early days of psychoanalysis, the side of human personality perceived to be ‘darker’ has attracted considerable attention. A century ago, Sigmund Freud wrote *On Narcissism* (Freud, 1914/1956); today, literature on the Dark Triad of subclinical narcissism, Machiavellianism, and subclinical psychopathy¹ is growing at an exponential rate. Even since Furnham, Richards, and Paulhus (2013) published a ten-year review of the subject, the number of studies in the field has expanded drastically; the last quarter of 2014 saw the publication of a special edition of a journal on the subject (*Personality and Individual Differences*, vol. 67). The focus of this submission, is, at its core, the Dark Triad (DT), this trio of moderately inter-correlated yet distinguishable personality traits that has been studied for a little over a decade (Paulhus & Williams, 2002). This submission primarily consists of seven chapters that centre on empirical studies I have undertaken. Six have either been published, or are currently under review. Because these span a number of areas (i.e., attractiveness, mating strategies, lifestyle orientation, sexual competitiveness, self-presentation, and the assessment and conceptualisation of DT with a popular brief inventory), literature that pertains to these domains is reviewed within each chapter. I examine the general background literature for narcissism, Machiavellianism, and psychopathy, as well as the relationship between personality and evolutionary psychology in my first chapter. I conclude with a brief overview of the DT as a trait constellation. Essentially, this chapter aims to address the traits relative to their adaptive/maladaptive correlates and outcomes, and explain why individual differences in them have persisted over evolutionary time.

Additional background and reflection sections serve to extend my papers further. These encompass material that could not be included for reasons of word count, or research that has been published since, but warrants inclusion in this submission. In this way, Chapters

¹ Hereafter, I use the terms ‘narcissism’ and ‘psychopathy’ to refer to these sub-clinical, spectrum-based personality traits unless otherwise noted.

2 through 8 constitute a series of self-contained yet connected studies, with the logic and theoretical impetus for each presented prior to copies of the relevant manuscript.

The running order is as follows:

Chapter 1: *Narcissism, Machiavellianism, and Psychopathy: The Dark Triad;*

Evolutionary Psychology, Personality, and Individual Differences.

Literature review.

Chapter 2: *The Dark Triad personality: Attractiveness to women.*

Published as: Carter, G. L., Campbell, A. C., & Muncer, S. (2014a). The Dark Triad personality: Attractiveness to women. *Personality and Individual Differences* 56, 57-61.

Chapter 3: *The Dark Triad and mating preferences.*

Unpublished manuscript.

Chapter 4: *The Dark Triad: Beyond a 'male' mating strategy.*

Published as: Carter, G. L., Campbell, A. C., & Muncer, S. (2014). The Dark Triad: Beyond a 'male' mating strategy. *Personality and Individual Differences*, 56, 159-164.

Chapter 5: *Women's sexual competition and the Dark Triad.*

Published as: Carter, G. L., Montanaro, Z., Linney, C., & Campbell, A. C. (2015). Women's sexual competition and the Dark Triad. *Personality and Individual Differences*, 74, 275-279.

Chapter 6: *Less-than candid camera: A preliminary study of the verbal and nonverbal behaviors of Dark Triad individuals in dating-profile videos.*

Manuscript submitted for publication.

Chapter 7: *Health, social, and psychological outcomes of the Dark Triad.*

Published as: Jonason, P. K., Baughman, H. M., Carter, G. L., & Parker, P. (2015). Dorian Gray without his portrait: Psychological, social, and physical health costs associated with the Dark Triad. *Personality and Individual Differences*, 78, 5-13.

Chapter 8: *The Dark Triad ‘Dirty Dozen’: A Mokken analysis of sex and age differences in item structure.*

Published as: Carter, G. L., Campbell, A. C., Muncer, S., & Carter, K. A. (2015). A Mokken analysis of the Dark Triad ‘Dirty Dozen’: Sex and age differences in scale structures, and issues with individual items. *Personality and Individual Differences*, 83, 185-191.

Chapter 9: General Discussion

Summary and suggestions for future research.

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Chapter 1

Narcissism, Machiavellianism, and Psychopathy: The Dark Triad; Evolutionary Psychology, Personality, and Individual Differences.

Introduction

By way of providing an introduction to, and overview of, the individual Dark Triad (DT) traits, I have below adopted a similar approach to Nettle (2007) in his evaluation of the Big 5. For each of narcissism, Machiavellianism, and psychopathy, I present an overview of their characteristics, benefits, and costs. This chapter will consider each trait in turn, documenting work that assesses the utility of high and low levels of these traits, before moving on to discuss the concept of DT as a collective, and focusing on work which has been undertaken on them together. Individual differences in relation to evolutionary theories will be discussed more generally, before outlining how each chapter of this thesis builds on previous literature.

Narcissism

Narcissism is characterised by a grandiose self-view, selfish and attention-seeking behaviours, and the placement of high value on material wealth and physical appearance (Twenge & Campbell, 2009). It is also associated with a socially-outgoing style (Holtzman, Vazire, & Mehl, 2010), and limited concern for others (an ‘agentic’ worldview, Campbell, Bosson, Goheen, Lakey, & Kernis, 2007). These characteristics might initially suggest the trait is undesirable; however, narcissists tend to create favourable first impressions (Back, Schmukle, & Egloff, 2010) and achieve high status in hierarchies (Maccoby, 2000). Narcissism has in fact been positioned as the ‘brightest’ (or ‘lightest’) of the Dark Triad. Originally, this referred to the creation of more favourable interpersonal impressions than Machiavellianism and psychopathy (Rauthmann, 2012). However, the notion of narcissism as

‘lighter’ has also come to refer to broader benefits associated with the trait relative to its costs, and in comparison with the other elements of DT (Rauthmann & Kolar, 2012; Chapter 7, this submission).

This is not to suggest that narcissism is wholly adaptive. Rather, there is a balance between the utility of high and low levels of the trait, as well as the trait’s costs and benefits, hence the individual differences that remain across the population (see below for a more extensive discussion of individual differences). Highly-narcissistic individuals’ interpersonal style and self-focus can incur negative social evaluations (and outcomes) in cooperative circumstances, or over time (Campbell, Bush, Brunell, & Shelton, 2005; Rauthmann, 2012). For this reason, they have difficulty in maintaining interpersonal relationships (Campbell, 2005; Jonason, Li, & Buss, 2010). Furthermore, their addiction to feeling admired and desired means that they, at times, incur social problems that means they may need to change their social environment (Baumeister & Vohs, 2001). Narcissism is also a resource-demanding trait, since highly-narcissistic individuals engage in expensive adornment and high levels of grooming (Holtzman & Strube, 2013).

Individuals high in narcissism are less likely than those with low levels of the trait to have an accurate view of themselves, in that their self-perception is not necessarily shared by others (John & Robins, 1994; Rauthmann, 2012). Highly-narcissistic individuals’ inflated self-views may put them at odds with those around them; inaccurate views of this kind undermine communality between the individual and their social environment (Gabriel, Critelli, & Ee, 1994; Campbell, Rudich, & Sedikides, 2002). In addition, although the relationship between narcissism and self-esteem is debated (Jordan & Zeigler-Hill, 2013), evidence suggests narcissistic individuals base their self-esteem on a perceived superiority over others (Brown, Budzek, & Tamborski, 2009). Whilst this may “blunt the impact of life’s trials and tribulations” (Brown et al., p. 960), like an over-inflated balloon, their self-esteem

is larger but also more fragile, and more susceptible to exploding (Thomaes & Bushman, 2011). Moreover, negative experiences appear to ‘haunt’ narcissistic individuals for a long time: Highly-narcissistic individuals are extremely apt to recall negative personal descriptors, for example (Thomas, Hashmi, Chung, Morgan, & Lyons, 2013): Hubris rarely persists unrepressed; nemesis is apt to follow. Non-narcissists do not share this persistent vulnerability to self-esteem threats and consequent mental health (Baumeister & Vohs, 2001).

Narcissistic individuals’ self-centred approach to life undermines and erodes social groups (Campbell et al., 2005). They value ‘getting ahead’ rather than ‘getting along’ (Hogan, 1983), exhibiting an hubristic style than can facilitate dominance (Tracy, Cheng, Martens, & Robins, 2011). However, a collective, cooperative personality, in ancestral times, would have been critical for individual survival (Jaeggi, Bukart, & Van Schaik, 2010; Johnson & Bering, 2006; Buss, 2005). In response to a narcissistic personality jeopardising group survival or cohesion, ostracism, as a punishment, would be akin to a death sentence, and indeed has been used throughout human history as a proxy for such (e.g., Forsdyke, 2005). Whilst the cost to physical survival has largely abated in modern environments, being socially ostracized remains a deeply traumatic and aversive experience, comparable with physical pain, and is hazardous to health (Case & Williams, 2004; Ouwerkerk, Kerr, Galluci, & Van Lange, 2005).

Narcissism has also been consistently linked to high levels of interpersonal aggression, both indirectly and directly expressed (for an overview, see Bushman & Baumeister, 1998). Although aggression can enhance dominance and create impressions of ‘formidability’, it can incur substantial costs, especially in response to potentially ‘losing face’ (e.g., Wilson & Daly, 1985), and when in a public setting (Ferriday, Vartanian, Mandel, 2011). Non-narcissists are likely to be at an advantage in avoiding this ego threat-aggression cycle.

An additional body of evidence has considered narcissism’s numerous outcomes in

relation to fitness and, in particular, mating. High levels of narcissism have been linked to increased levels of self-reported sexual success, indexed as lifetime (usually short-term) sex partners (e.g., Holtzman & Strube, 2012); some evidence exists to suggest that this is also reflected in a higher number of lifetime offspring (Rowe, 1995). Holtzman and Strube (2011), in arguing for the importance of adopting an evolutionary perspective on narcissism, proposed various mating-related solutions to the “puzzle” (p. 210), of narcissism’s persistence over evolutionary history. Holtzman and Strube primarily focus their arguments on the relationship between narcissism and short-term mating in men, proposing hypotheses about, for example, a narcissism-related advantage in sperm competition and enhanced olfactory perceptions of women’s fertility. Speculative at present, evidence is needed regarding comparative sexual “machinery” (p. 216). Notably, however, Holtzman and Strube give no consideration to highly-narcissistic women².

The sum of the fitness-related benefits against the costs of narcissism seems to indicate the trait is high in respect of net utility. Caution must be exercised against such a straightforward interpretation, however. Although the trait has been looked at in a global context, much existing knowledge of its fitness-related costs and benefits is largely restricted to young (student-age), middle-class, Western men.

Socio-environmental and cross-cultural variations also bear consideration in relation to individual differences in narcissism. Narcissism is more prevalent in individualistic Western social environments (North America; Western Europe) than in collectivist ones, more typical of Asian or Middle-Eastern countries (Foster, Campbell, & Twenge, 2003). Moreover, in the United States, a prominent example of an individualistic social environment, narcissism levels have been steadily increasing for the last thirty years (Twenge, Konrath,

² To extend Holtzman and Strube’s hypotheses to women, research could consider narcissistic women’s sperm retention; that is, whether narcissistic women experience more orgasms than non-narcissistic women when partnered with mates of high genetic quality (see also Baker & Bellis, 1993; Thornhill, Gangestad, & Corner, 1995).

Foster, Campbell, & Bushman, 2008), as has a tendency towards self-focus (a key component of narcissism) in other western cultures (e.g., Nafstad, Blakar, Carlquist, Phelps, & Rand-Hendriksen, 2007). This contemporary cultural support suggests there are substantial environmental and cultural determinants of the trait, beyond genetic factors. Current American and European societies are extremely tolerant, even encouraging, of narcissism (e.g., the 'selfie' meme, celebrity culture, cosmetics, affordable cosmetic surgery).

The present generation of young (Western) adults - those born after the Millennial Generation have not, as of yet, been afforded their own generational label. Debate persists, but Twenge's (2008) proposal for the label "Generation Me" seems apt, since, as Twenge and Campbell (2009) have pointed out, Western society is undoubtedly living in an 'age of entitlement'. If the social environment continues to support the persistence of narcissism as an advantageous trait in such a manner, we could logically expect levels of the trait to continue to increase. Twenge (2011) provides evidence for a social environment that increasingly favours narcissistic individuals; this socio-cultural environment that currently prevails in the US (and, to a lesser extent, other countries) offers substantial social benefits to those scoring highly for the trait: To take one example, narcissistic Facebook profiles are viewed more favourably than control profiles (Buffardi & Campbell, 2008).

Further work in collectivist societies – which is presently limited – is also warranted in terms of the prevalence and perception of highly-narcissistic individuals and their behaviours. Some tentative evidence exists to suggest narcissism may be increasing in China (Cai, Kawn, & Sedikides, 2012), however, and is higher in the United Arab Emirates than in the U.K., (Lyons, Morgan, Thomas, & Al Hashmi, 2013; Thomas, Al Hashmi, Chung, Morgan, & Lyons, 2013), perhaps as a result of the increasing influence of Western cultural trends and individualistic values.

To conclude, narcissism simultaneously provides substantial benefits as well as

representing a number of potentially devastating costs for those with high levels of the trait. Narcissism has been proposed to represent a candidate ‘solution’ to the ‘problem’ of short-term mating, and this argument seems convincing - at least, in respect of the issues faced by men. The current picture of how high levels of narcissism might provide benefits to women in respect of mating is less clear, however (but see Chapter 5). Narcissists’ trait-typical attitudes and behaviours predispose them to pursue, and to some extent succeed in pursuing, a ‘get ahead’, rather than ‘get along’ strategy. Ultimately, though, this is constrained by species-typical cooperation and communality, and the limited tolerance within the broader population for individuals with a self-serving, almost solipsistic approach to life and others. Even so, narcissistic individuals’ highly-social disposition means they are to some extent protected from the consequences of their actions, insofar as they are able to ‘drop’ individuals and groups and, through their Extraversion, positive impression-formation, and high levels of emotional intelligence, immerse themselves in new communities. In particular, this social focus is likely to impart a degree of protection against the deleterious health outcomes (including a lower life expectancy) of loneliness; social support has been found to benefit health substantially (Cohen, 2004; Cohen & Wills, 1985; see also Chapter 7).

Machiavellianism

Machiavellianism is defined by an unemotional, evaluative, and pragmatic approach to life and interpersonal relationships (Christie & Geis, 1970; Jones & Paulhus, 2009).

Individuals characterised by high levels of the trait (“high-Machs”) maximise personal outcomes at the expense of others (Ryckman, Thornton, & Butler, 1994), endorse deception and manipulation as interpersonal tactics (Hawley, 2006), and have an amoral and agentic perspective on the world and its inhabitants (Wiggins & Broughton, 1991). They are also cynical, believing that others are prone to cheat (Mudrack, 1993), but appear to have limited faith in others’ ability to successfully engage in this, or any other, ‘controlling’ strategy

(McHoskey, 1999). High-Machs are driven by a motivation to ‘win’, ideally individually (rather than as part of a group), regardless of the focus of the competition (e.g., money, power, sex; Lee et al., 2013; Ryckman et al., 1994; Stewart & Stewart, 2006). It is therefore unsurprising that these individuals are low in communality (McHoskey, 1999; Watson & Morris, 1994), Honesty-Humility (Lee & Ashton, 2005), Conscientiousness, and Agreeableness (Jakobwitz & Egan, 2006; Paulhus & Williams, 2002).

In respect of interpersonal tactics, high-Machs endorse ‘softer’ approaches to interpersonal exchanges that encompass persuasion, self-disclosure, and ingratiation (Fehr, Sampson, & Paulhus, 1992; Grams & Rogers, 1990) as well as ‘harder’ or ‘darker’ tactics like deceit, thought manipulation, and inducing guilt and similar negative emotions in others to ensure their desired outcome (Kumar & Beyerlein, 1991; Vangelisti, Daly, & Rudnick, 1991; see also Jonason, Slomski, & Partyka, 2012). They also adopt a ‘rude’ style when engaging in the derogation of (sexual) competitors (Goncalves & Campbell, 2014). Fundamentally, they see others as ‘puppets’, with little control over their own destiny; they see themselves, conversely, as ‘puppet masters’ (McHoskey, 1999).

As a result of these, and other negative characteristics (see below), Machiavellianism is typically regarded as a ‘darker’ trait than narcissism. For reasons of theoretical and statistical intersection (Egan, Chan, & Shorter, 2014; Lee & Ashton, 2005; Pailing, Boon, & Egan, 2014; see also Chapter 8), Machiavellianism is often aligned more closely with psychopathy, forming one half of a “dark dyad” (Egan, personal communication), and, recently, has been connected with sadism in relation to online interpersonal aggression commonly referred to as “trolling” (Buckels, Trapnell, & Paulhus, 2014). Highly Machiavellian personalities are frequently seen as focused on destabilizing others to benefit themselves: Malevolent, vindictive, and quasi-psychopathic. Indeed, some evidence suggests that certain correlates are best explained by the overlap between these traits (e.g., vengeance;

Nathanson, 2008), and some theorists have argued that Machiavellianism and psychopathy are not, at a fundamental level, distinct traits (McHoskey, Worzel, & Szyarto, 1998).

Although aspects of Machiavellianism and psychopathy overlap (as both also do with narcissism), the notion that they are isomorphic is not supported (Paulhus & Williams, 2002; Jakobwitz & Egan, 2006). However, Machiavellianism has proved to be the most difficult of the DT traits to characterise. One reason is that the trait has received less attention than either narcissism or psychopathy, so the available knowledge on Machiavellianism is more limited. Indeed, only three articles have attempted to articulate an overview of Machiavellianism (Fehr et al., 1992; Hawley, 2006; Jones & Paulhus, 2009), and, at the time of writing, no dedicated handbook has yet been published on the subject. However, recent attention towards the trait suggests a more promising future (Aitken, Lyons, & Jonason, 2013; Brewer, Abell, & Lyons, 2014; Lyons, Caldwell, & Shultz, 2010). Another issue may be that a number of studies have reported inconsistent results regarding relationships between Machiavellianism and several correlates. These include a resistance to feelings of guilt (Drake, 1995; Wastell & Booth, 2003), and an instrumental vs. emotional decision-making style (Bartels & Pizarro, 2011; Giammarco & Vernon, 2014), elements that have traditionally been suggested to form part of the “core” of Machiavellianism.

Despite its fundamentally anti-social nature, Machiavellianism has persisted over evolutionary history; it is clearly, therefore, not without its benefits. High-Machs create positive first impressions (Ickes, Reidhead, & Patterson, 1986; see also Chapter 6), especially as potential leaders (Coie, Dodge, & Kupersmidt, 1990; Deluga, 2001). They show flexibility in their behaviours in terms of cooperative and exploitative strategies, even from a young age (Newcomb, Bukowski, & Pattee, 1993; Hawley, 2003, 2006; Wilson, Near, & Miller, 1998). They also thrive in less structured social environments (Shultz, 1993). Indeed, many of the advantages that high-Machs are able to enjoy are proposed to largely be a result of their

behavioural flexibility (Barry, Kerig, Stellwagen, & Barry, 2011; Wilson et al., 1996). This attribute is of clear benefit to high-Machs; it undoubtedly results in positive outcomes for them. In ancestral terms, an ability to alternate cooperation with the intermittent exploitation of others over time (ideally with minimal risk to the self) would have led to survival and reproductive advantages, particularly in unstable social environments (Figueredo et al., 2006). There is no evidence to suggest these favourable outcomes have abated (Hawley, 2006).

High-Machs' flexibility in choosing to employ seemingly cooperative strategies in some circumstances allows them to adopt a behavioural 'feint', obscuring any underlying long-term and self-centred goals (Wilson et al., 1996). In essence, their behaviour reflects a constant, background evaluative process: As long as cooperation is the most advantageous strategy for them, it is the one they will likely employ. Once the cost-benefit analysis tips, such that the costs of continued cooperation become too great or an opportunity for personal benefit emerges, high-Machs will abandon any collaborative strategies, and extract what benefits they can before removing themselves from the situation (Becker & O'Hair, 2007), seeking to undermine those they leave behind in the process (in the manner of 'salting the earth'). High-Machs are unforgiving, and inclined to commit sabotage and other harmful acts against groups or individuals (Dahling, Kuyumcu, & Librizzi, 2012). This will, in all likelihood, bring an end to the relationship(s) in question, with the cycle beginning anew with different targets.

In terms of costs, although they are viewed positively as leaders (Deluga, 2001), as colleagues, co-operators, or social partners, high-Machs typically come to be viewed negatively (Wilson et al., 1996), and are poorly regarded by hierarchical superiors (Ricks & Fraedrich, 1999). This is partly because high-Machs have a limited remit for their optimal functionality: They need flexible environments in which to operate (Jones & Paulhus, 2009).

They are not suited to social milieux with prescriptive rules, regulations, responsibilities, or taboos that limit what behaviours are considered to be acceptable (or legal). In essence, where their behavioural flexibility, or “latitude for improvisation” (Jones & Paulhus, 2009, p. 96) is constrained, their primary functional strength is neutralised³.

Moreover, the cost of losses in the competitive, risky, and social environments that high-Machs seek out can be considerable. Wilson et al. (1996), for example, imply that high-Machs’ abilities only extend to fooling ‘some of the people, some of the time’. The consequences of failure in this regard can be considerable: As with narcissism, this might incur not only ostracism, but also direct aggression by others. Individuals who do not possess high levels of the trait, and do not enter this relatedly ‘high-stakes’ game, do not encounter the same risks. This perspective was endorsed by Hawley (2006), who suggested that low-Mach children (“non-controllers”) did better to “stay out of the fray” (p. 155).

Similarly, Machiavellianism is related to a propensity to cheat in a number of domains (Jones & Paulhus, 2009), for example, in respect of tax avoidance, academic endeavours, or deal-breaking. Whilst this may afford high-Machs a potential edge in such scenarios, they are again running risks. Individuals characterised by low levels of the trait (“low-Machs”) entirely offset the potential cost of getting caught. Especially for high-risk opportunities (e.g., signing a contract, obtaining a qualification, winning a competition), high-Machs have to be consistently accurate and/or lucky in judging the chance they will ‘get away with’ their manipulations.

Moreover, although low-Machs might seem to be potential targets for exploitation, this may not be the case. Firstly, low-Machs have a lower tolerance for unethical behaviour and they value morality more than high-Machs (Mudrack, 1993; Musser & Orke, 1992). This

³ This is in keeping with the original concept of Machiavellianism, as derived by Christie (1970) from Machiavelli’s (1532) original work. Machiavelli’s text addresses princes and other rulers – not individuals who would typically have had to endure many constraints on their behavior or choices.

might serve to detect or defend against potential exploitation, avoiding scenarios, such as those described above, that involve duplicity and therefore carry risk. Additionally, low-Machs are not characterised by the same limited levels of emotional intelligence as high-Machs (Austin, Farrelly, Black, & Moore, 2007; Carnahan & McFarland, 2007; Simon, Francis, & Lombardo, 1990). Aside from benefits to cooperative functioning, this may even impart an ability to turn the tables and ‘exploit the exploiters’ (e.g., Buss & Duntley, 2008). If able to discern and understand a high-Mach mentality, low-Machs may be able to harness high-Machs’ inclinations and abilities by, for example, directing them towards roles where they can counter out-group opposition (Wilson et al., 1998), or by promoting charitable undertakings, which high-Machs are content to engage in if they anticipate good publicity (Bereczkei, Birkas, & Kerekes, 2007; see also Bourke, Bamber, & Lyons, 2012). High-Machs themselves are therefore not immune to being exploited, and may even be highly vulnerable to specific types of exploitation, through failing to account for others’ competence.

It is also worth noting the absence of a relationship between Machiavellianism and intelligence - one that is popularly believed to exist. Not only is Machiavellianism unrelated to general intelligence and IQ (Wilson et al., 1996), but it also shows a non-existent or negative relationship with Theory of Mind (Lyons et al., 2010; Paal & Bereczkei, 2007) and a negative correlation in respect of empathy, emotional intelligence (‘EQ’) and emotional recognition, (Austin et al., 2007; Carnahan & McFarland, 2007; Pilch, 2008; Simon et al., 1990).

As stated earlier, the relationship between Machiavellianism and a number of variables is unclear. This is true of some outcomes that could be considered to represent the trait’s most substantial ‘costs’. Some studies, including Fehr and colleagues’ (1992) review, have indicated that Machiavellianism is related to anxiety. Others report an absence of this relationship (e.g., Allsopp, Eysenck, & Eysenck, 1991; Paulhus & Williams, 2002).

Machiavellianism also demonstrates an inconsistent relationship with impulsivity. Significant correlations have proven fickle in relation to the study of the trait individually, and as a part of the DT constellation. Some researchers have found that Machiavellianism is related to impulsivity (Kerig & Stellwagen, 2010); some have also found evidence suggesting they have limited self-control (Jonason & Tost, 2010). The debate regarding Machiavellianism's relationship with impulsivity is not entirely resolved, as findings continue to differ (Jones & Paulhus, 2011). It is, however, important to emphasise that high-Machs' perspective is not simply short-term; in bargaining games, for example, their likelihood of betraying a fellow participant is related to whether it is a one-shot, no-retaliation opportunity, or whether there is the chance for them to be 'paid back' (Gunnthorsdottir, McCabe, & Smith, 2002; Meyer, 1992). Thus, it cannot be entirely correct to suggest that Machiavellianism represents a fundamentally short-term perspective (Jones & Paulhus, 2009).

In respect of evolutionary psychology, adopting such an approach to Machiavellianism was first proposed almost two decades ago (Wilson et al., 1996). Wilson and colleagues did not see Machiavellianism as maladaptive or undesirable per se, but considered that it might represent an adaptive trait in terms of maximising personal outcomes without (or with only minimal and pragmatic) consideration of the effects on others. This tendency is expressed within the context of high levels of behavioural flexibility, including the use of cooperation (and other socially-desirable traits) as and when required (an attribute directly drawn from Machiavelli's (1532) original treatise⁴), and aggression and punishment at other times. Hawley (2006) described high-Mach individuals as "bistrategic", in that they choose to adopt prosocial or coercive tactics as the situation demands. This approach to the world is manifest even in high-Machs' early childhood (Hawley, 2002).

⁴ Of many potential quotations, one example notes: "Whosoever desires constant success must change his conduct with the times" (Machiavelli, 1532).

As with narcissism, reports have often indicated that men score higher for Machiavellianism than women (Paulhus & Williams, 2002; Jonason, Li, Webster, & Schmitt, 2009). However, this sex difference is more inconsistent than the sex difference in narcissism (and where reported, frequently shows a weak effect size, e.g., Jonason et al., 2009). A number of studies have found no sex difference, and some have even reported higher female scores (Biggers, 1978; Chonko, 1982; Mostafa, 2007; Giammarco & Vernon, 2014). Nonetheless, studies that have considered Machiavellianism (distinctly, or as part of DT) and mating behaviours - particularly short-term mating behaviours - have tended to focus more heavily, or even exclusively, on men (e.g., Aitken et al., 2013; Rauthmann, Kappes, Lanzinger, 2014). Calls for empirical attention to be paid to high-Mach women (not least in respect of mating strategies) have existed for more than a decade (Wilson et al., 1996). As such, sex-differences in DT, including Machiavellianism, are a focus of a number of the studies presented in this thesis (Chapters 4 and 6). Evidence to date suggests that Machiavellianism is related to a promiscuous sexual style: High-Mach men have more sexual partners than controls, whilst high-Mach women engage in more extra-pair relationships - seemingly without endangering their long-term partnership(s) (McHoskey, 2001; Jones & Paulhus (under review)).

In terms of the trait's global prevalence, Machiavellianism has been shown to vary between cultures, with levels of the trait lower in collectivist than individualist societies (i.e., in China: Okanes & Murray, 1982; Oksenberg, 1971). Moreover, the scores of western populations on the standard measure for the trait (the Mach-IV; Christie & Geis, 1970) have increased over recent decades (Jakobwitz & Egan, 2006; Nigro & Galli, 1985) in line with scores on the Narcissistic Personality Inventory (Raskin & Terry, 1988; Twenge et al., 2008). Individualistic societies are more tolerant of – and even actively endorse – behavioural flexibility (in the manner of taking initiative, or applying lateral thinking). Latitude for

improvisation allows one of the most beneficial aspects of Machiavellianism, behavioural flexibility, to flourish (Bereczkei, Deak, Papp, Perlaki, & Orsi, 2013; Christie & Geis, 1970; Czibor & Bereczkei, 2012).

Despite their advantages in certain ecologies and social environments, however, Mealey's (1995) argument regarding the necessarily frequency-dependent nature of social cheaters is relevant to both balancing selection theories of Machiavellianism and the cost-benefit analysis of the trait. Highly Machiavellian individuals can only exist in limited numbers within any given society, as the advantage of the trait is predicated on this being the case. If high-Machs became more prevalent (over many generations), there would be few(er) 'suckers' left in the population whom they could manipulate.

To conclude, Machiavellianism is associated with a suite of behaviours that appear to support the functioning and, potentially, the reproductive success of the individual, but the effectiveness of these behaviours is mitigated by costs, and dependent upon the flexibility of social environment: Highly-Machiavellian individuals' 'bistrategic' behavioural style is best suited to less-structured social environments. Socio-environmental restrictions (i.e., rules, regulations, laws) heavily constrain the benefits of the trait.

Psychopathy

Prior to reviewing the literature on psychopathy, a point merits consideration. The study of this trait can be difficult to chart, as the literature is pervaded by studies of clinical psychopathy (or else of sociopathy, or antisocial personality disorder; see, for example, Barr & Quinsey, 2004). This is even truer of psychopathy than narcissism, the latter of which is more frequently and readily differentiated from its clinical counterpart (NPD: Campbell & Miller, 2011). Many authors do not make distinctions between clinical and subclinical populations or research when referring to either "psychopaths" or "psychopathy". In this section, and across this submission, I have endeavoured to avoid reviewing literature

pertaining to clinical or institutionalized samples or measurements. However, where no subclinical data are available, and I have drawn on evidence from clinical or incarcerated samples, this is reflected in the reference.

Individuals characterized by high levels of subclinical psychopathy are deficient in Agreeableness, Conscientiousness, guilt and shame, and have a callous interpersonal disposition (Lyons, 2014; Paulhus & Williams, 2002). They are impulsive, and thrill-seeking (Williams & Paulhus, 2004); this frequently leads to behavioural misconduct (bulling, resistance to authority, risky drug taking/driving) (Nathanson, Paulhus, & Williams, 2006a). They demonstrate low levels of integrity, with a limited capacity for moral reasoning (Connelly, Lilienfeld, & Schmeelk, 2006). They also have limited levels of empathy, and emotional understanding (Ali, Amorim, & Chamorro-Premuzic, 2009). However, although such a ‘dark’ overview of this personality type may suggest the trait is maladaptive – a perspective adopted by some (e.g., Torres, 2002) – it is nonetheless associated with a number of benefits.

Highly-psychopathic individuals frequently adopt an exploitative or ‘cheater’ style in interpersonal relationships that allows them to take advantage of population-typical cooperation (Buss & Penke, in press). Especially in modern, large-scale societies (taking a cultural facilitation/ environmentally-contingent perspective), where many interactions may be one-shot encounters, this sort of deceitful, self-enhancing strategy may be particularly efficacious, incurring only limited consequences (Buss & Greiling, 1999; Glenn, Kurzban, & Raine, 2011; Wilson, 1995).

Supporting this, highly-psychopathic individuals’ decision-making style is relatively unconstrained by emotion. Rather than adopt the popular conception of psychopathic individuals as ‘immoral’ (i.e., nefarious, in their attitudes or behaviours), it is perhaps more accurate to describe them as ‘amoral’. To provide an example, Barterls and Pizzaro (2011)

found that psychopathy (like Machiavellianism) was positively correlated with making utilitarian choices across a range of moral judgment dilemmas, and related to low levels of life meaningfulness (i.e., the value of a human life). In being relatively immune to feelings of guilt (Blair et al., 1995; Hare, 1991), highly-psychopathic individuals are not subject to the same negative emotions experienced (or anticipated) by others in making choices which benefit themselves. Indeed, guilt has been found to be associated with making *less* self-advantageous decisions (Ketelaar & Au, 2003). Since highly-psychopathic individuals do not experience guilt in association with what others perceive as ‘immoral’ decisions, they are well-equipped to focus on pursuing self-interested outcomes without remorse. In addition, a relatedly callous (and fearless) disposition allows some psychopathic individuals to achieve high status (Akhtar et al., 2013; Mullins-Sweatt, Glover, Derefinko, Miller, & Widiger, 2010).

Nonetheless, the trait also has its costs. The fundamentally aggressive disposition of highly-psychopathic individuals may incur substantial consequences (e.g., Reidy, Zeichner, Miller, & Martinez, 2007). This is undoubtedly exacerbated by an inability to assess risks, or learn from previous ‘mistakes’ (Van Honk, Hermans, Putman, Montagne, & Schutter, 2002). Overall, these individuals show an oversight of social and personal costs, preferring to focus on either (potential) personal rewards, or immediately gratifying behaviours, which can have extreme consequences for the lifespan of both interpersonal relationships, and the individual themselves (Akhtar, Ahmetoglu, & Chamorro-Premuzic, 2013; Jonason, Koenig, & Tost, 2010). In fact, highly-psychopathic individuals have a comparably impaired ability to make accurate risk judgments as persons who have orbitofrontal lesions (Van Honk et al., 2002). Psychopathy’s trait-typical future discounting, poor impulse control (Jonason & Tost, 2010), and high levels of dysfunctional impulsivity (Jones & Paulhus, 2011) represent a potent and costly combination. Ultimately, it is therefore perhaps unsurprising that subclinical

psychopathy is typically viewed as the darkest of the DT traits (e.g., Rauthmann & Kolar, 2012, but see Paulhus & Williams, 2002).

In considering some of the most negative outcomes with which psychopathy is associated, the notion of ‘successful psychopaths’ and ‘unsuccessful psychopaths’ bears reference. The former term encompasses those (often high-achieving) individuals who seem to have harnessed their personality to beneficial ends, frequently through interpersonal dominance (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005), typically achieved via bullying or abuse, and/or emotional detachment (Babiak & Hare, 2006; Hall & Benning, 2006). ‘Unsuccessful’ psychopaths are conversely regarded as those who share a similar personality type but have engaged in such extreme antisocial or criminal behaviour that they have been institutionalized. The relationship between criminality and psychopathy is a contentious issue (e.g., Cooke & Michie, 2001; Hart & Hare, 1997), and one beyond the remit of this thesis. From a cost-benefit analysis perspective, however, those towards the more extreme (or ‘unsuccessful’) end of the personality spectrum serve as an illustration of the potential costs which may be incurred by individuals characterized by high levels of the trait. Incarceration aside, at least one small-scale study has shown additional differences between ‘successful’ and ‘unsuccessful’ psychopaths: The former have better cardiovascular stress reactivity and increased autonomic and executive functioning (on the Wisconsin Card-Sorting Task) compared with both ‘unsuccessful’ psychopaths and control participants (Ishikawa, Raine, Lencz, Bihrlé, & Lacasse, 2001; see also Gao & Raine, 2010).

In being poorly suited to cooperative undertakings (e.g., Gervais, Kline, Ludmer, George, & Manson, 2013), whilst highly-psychopathic individuals will, at times, be able to exploit others, this will not always be the case, and with some evidence suggesting that they are not always able to successfully go undetected (Fowler, Lilienfeld, & Patrick, 2009; Holtzman, 2011), their tactics will at least sometimes fail, with potentially dire consequences.

Their antisocial and malevolent nature, if (or when) detected, is likely to result in expulsion from the group, not only leaving them unable to continue to draw any group benefits, but also without potential targets to exploit. Although, as mentioned above, many interactions in the modern world may be one-shot encounters, humans are typically a social species, and friendship networks, family networks and vocational roles all typically depend on at least a degree of cooperation.

Another major area in which psychopathy is related to both costs and benefits is mating. Similar to both narcissism and Machiavellianism, one of the major arguments in favour of psychopathy as at least partially adaptive is its facilitation of a short-term mating strategy, and thus an increased chance of reproductive success (Gladden, Figueredo, & Jacobs, 2009; Jonason, Li, Webster, & Schmitt, 2009; Murphy & Stich, 2000; Rowe, 1995). Formative evidence suggests there are least two ‘routes’ that connect psychopathy with increased levels of short-term mating.

The first is high levels of physical self-adornment. In a study by Holtzman and Strube (2012), psychopathy was found to be a strong predictor (stronger even than narcissism) of ‘successful’ adornment – that is, physical self-enhancement that increases impressions of attractiveness. However undesirable aspects of their personality may be, highly-psychopathic individuals show an ability to create a physically-attractive veneer.

The second ‘route’ to psychopathic individuals’ (primarily mens’) higher levels of short-term mating may be a ‘scatter gun’, or highly-opportunistic approach to relationships. Individuals with high levels of psychopathy, it is reported, typically pursue and compete for more potential mating opportunities than those low in the trait due to their focus on short-term mating and comparatively low threshold partner requirements for engaging in short-term relationships (e.g., Jonason, Valentine, Li, & Harbeson, 2011). If this proves successful, they are at an advantage; even if they experience frequent rejection, they are equipped to deal with

this, typically having a robust, non-neurotic disposition (Paulhus & Williams, 2002), which provides a buffer response to rejection or adverse feedback (Taylor & Armor, 1996).

In terms of costs, although highly-psychopathic individuals report greater levels of success in poaching mates from others (Jonason et al., 2010; Kardum, Hudek-Knezevic, Schmitt, & Grundler, 2015), psychopathy is also related to an increased risk of having one's own mate poached by a rival in both short- and long-term relationships. In this sense, psychopathy appears *only* to facilitate a short-term mating strategy, and represents a threat to a long-term stratagem where reproductive output can be monopolized, investment in offspring can be established, and, for men, increased paternal certainty fostered. Longitudinal evidence regarding highly-psychopathic individuals' relationship outcomes would be valuable.

In terms of psychopathy's prevalence, Nettle (2007, after Mealey, 1995) adopts a description of psychopathy as located at the extreme (low) end of Agreeableness to explain why psychopaths can only occupy a relatively small niche in the population, via negative frequency-dependent selection. If highly-psychopathic individuals prevailed among the population, their advantages in respect of cheating and deceiving others would necessarily decrease, as was described in relation to high-Machs. At least in present conditions, a 'balance' appears to have been established between individuals who possess high and low levels of the trait, with estimates suggesting individuals characterized by high levels of psychopathy represent around 5% of the population, with this niche split strongly in favour of men, at c. 80:20 (Buss & Penke, in press; Lalumière, Mishra, & Harris, 2008; Mealey, 1995⁵). Whether 5% represents a stable prevalence, however, is not presently known because

⁵ Glenn et al. (2011) cite 1% as the prevalence of highly psychopathic individuals, but do not provide a reference for this figure. This may be an effect of different definitions of 'high' levels of psychopathy.

cross-temporal data are not available. It is possible that present environmental conditions allow for greater levels of the trait than previously.

Indeed, cross-temporal and cross-cultural evidence on psychopathy's prevalence is even more scant than that available for narcissism and Machiavellianism. The only available information on differential levels of psychopathy across the globe pertains to clinical levels of the traits (and indicates that European cultures typically have lower rates of clinical psychopathy than those reported in the US: Cooke & Michie, 1999; Dahle, 2006). Empirical evidence could explore whether significant differences in psychopathy levels can be observed between individualistic and collectivist cultures, and between small- and large-scale communities.

Finally, sex differences in psychopathy also bear consideration. As noted above, estimates regarding the prevalence of psychopathy in the population suggest highly psychopathic individuals represent approximately 5% of the general population, of which roughly 4% are men, and only 1% are women (Buss & Penke, in press; Mealey, 1995). Even studies which report no sex differences in narcissism and Machiavellianism (e.g., Giammarco & Vernon, 2014) still report a sex difference in psychopathy. Sex differences in psychopathy frequently show some of the largest effect sizes in personality psychology ($d > .80$; Lyons, Healy, & Bruno, 2013). In fact, the sex difference in psychopathy is often the driver of a sex difference in overall DT scores. Some researchers (e.g., Jonason et al., 2009; Lyons et al., 2013) have even suggested that primary psychopathy is a male-typical adaptation (for assorted 'problems', including lie-detection and short-term mating).

Nonetheless, highly-psychopathic women do exist and several of their behaviours are comparable with highly-psychopathic men; they are higher on aggression and impulsivity than control women (Crawley & Martin, 2006, see also Chapter 4) and exhibit the same cheating behaviours as their male counterparts (Nathanson, Paulhus, & Williams, 2006b). I

welcome calls from others (e.g., Blanchard & Lyons, 2010) who have recommended that highly-psychopathic women should receive more empirical attention, and I hope that future work on the trait will ensure that this population – however much of a minority – not go overlooked, in terms of research.

To conclude, when evaluating psychopathy for its costs and benefits, an observation by Glenn et al. (2011) seems apt: “Psychopathic traits may be most beneficial in individuals who are able to better regulate their behaviour...The “successful” psychopath...is generally thought of as one who refrains from serious antisocial behavior but who embodies the essential personality characteristics of psychopathy.” (p. 375). If they act in an unrestrained or uncontrolled manner, highly psychopathic individuals are likely to find themselves excluded from communities – whether socially, or through incarceration. Those who are able to exert a degree of self-control (to the extent that this is possible in such individuals) may be able to reap a number of advantages from their social and interpersonal style, both in terms of resources and access to sexual partners. Given the number of fitness indicators (sex partners; health-related behaviours; interpersonal dominance; acquisition of resources) that have been related to psychopathy, attention could usefully be focused upon long-term outcomes of the trait, with longitudinal data serving to increase our understanding of the trait as ‘dark’, but, as is indicating by existing work, associated with a number of benefits.

Table 1, below, summarising some of the major benefits and costs of the Dark Triad traits (comparisons are made between high- and low-scorers for each trait).

Table 1. Summary of benefits and costs of the Dark Triad traits

Narcissism		Machiavellianism		Psychopathy	
Benefits	Costs	Benefits	Costs	Benefits	Costs
Creation of favourable first impressions	Positive impressions erode relatively quickly	Creation of favourable first impressions	Positive impressions erode relatively quickly	Creation of favourable first impressions	Positive impressions erode relatively quickly
Pursuit of and success in achieving high status	Difficulty maintaining interpersonal relationships	Creation of impression of leader-like qualities	Difficulty maintaining interpersonal relationships	Fearless disposition and dominance can lead to achieving high status	Difficulty maintaining interpersonal relationships
Willingness and ability to compete with sexual rivals	Resource-demanding (personal adornment; grooming)	Thrive in less-structured environments	Often poorly regarded by superiors in structured environments	Low in guilt and shame, meaning decisions/actions are often self-serving	Limited levels of empathy and ability to understand emotions
Increased number of lifetime sex partners	Inaccurate self-perceptions, undermining communality	Behavioural flexibility, enhancing exploitation of situations/others	Propensity to cheat across scenarios can incur considerable negative outcomes	Increased levels of short-term mating through willingness to pursue and compete for mates	Dysfunctionally impulsive and aggressive, prompting behavioural misconduct and potential incarceration
Increased number of offspring (men)	Apt to recall negative personal descriptors	Amoral, agentic perspective prompts unemotional decision-making.	Lower levels of empathy, and emotional intelligence/recognition	Facilitates a short-term mating strategy through effective adornment	Inability to properly assess risks and failure to learn from mistakes
Associated with increased lifespan	High levels of interpersonal aggression Large, but fragile ego			Increased ability to poach mates from others	Increased risk of mates being poached by rivals Associated with negative health behaviours and truncated lifespan

The Dark Triad

The genesis of the collective study of these three ‘dark’ traits was a concern on the part of Paulhus and Williams (2002) that each of the traits’ independent, and substantial, bodies of literature were essentially describing and measuring the same construct. These concerns particularly arose from McHoskey and others, who indicated that Machiavellianism and narcissism (McHoskey, 1995) and Machiavellianism and psychopathy (McHoskey et al., Worzel, & Szyarto, 1998) overlapped. In addition, it is clear from the preceding sections on the individual traits that there are a number of common features among all of them. Paulhus and Williams applied the term ‘Dark Triad’ to encompass these traits as a collective. In their initial investigation, they established that their concerns were unfounded: Although the traits share a degree of overlap with one another, they were not equivalent. This, they noted, was most apparent in considering their external correlates. In their work, this encompassed cognitive ability, self-enhancement bias, and the Five-Factor Model of personality.

To some extent, the issue of distinctiveness between DT traits continues today. In their review, Furnham, Richards, and Paulhus (2013) note that some studies have indicated that elements of psychopathy and narcissism are highly related, at times loading on to the same factor; they also both occupy a similar area - cold; dominant – in interpersonal space (Miller et al., 2010; Furnham & Trickey, 2011; Lynam, 2011), although this has been attributed, in part, to which inventories are being used to measure the traits. The more concerning overlap, however, has typically been that between Machiavellianism and psychopathy, as alluded to above (see also Reise & Wright, 1996), and reflected in the review’s meta-analysis, which revealed the strongest correlations were between those traits (Furnham et al.).

This has led to debate about whether it is useful, or even appropriate, to study the traits as a composite. The general consensus appears to be that simultaneous study is desirable, but that analyses should account for the individual contributions of each trait to any

given outcome, as they may be unique, or the result of shared variance (e.g., Jakobwitz & Egan, 2006; Jonason & Kavanagh, 2010; Jonason, Luevano, & Adams, 2012; Jonason, Lyons, Bethell, & Ross, 2013). However, it is worth noting that all three traits do share a degree of overlap in some key respects: Agentic world-view (Paulhus & Williams, 2002; Jonason, Li, & Teicher, 2010), low Honesty-Humility (Lee & Ashton, 2005; Lee et al., 2013), and low Agreeableness (Vernon, Vilianni, Vickers, & Harris, 2008; Jonason & McCain, 2012) are among these.

Personality

Early studies which simultaneously measured all three components of the Dark Triad sought to place the trait constellation against a backdrop of other models of personality – specifically, ‘normal’ personality. The two most central (and related) of these have been the Big Five model (McCrae & Costa, 1999) and the HEXACO model (Lee & Ashton, 2005).

An attempt to map the Dark Triad onto the Big Five personality traits (Costa & McCrae, 1991) was one of the primary aims of Paulhus and Williams (2002). Research has proceeded to generate a recognizable pattern of results. The most persistent finding is of a negative relationship between the Dark Triad and Agreeableness and Conscientiousness (Paulhus & Williams, 2002; Jakobwitz & Egan, 2006; Nathanson et al., 2006a; Nathanson, et al., 2006b; Jonason, Li, & Buss, 2010; Jonason, Li, & Teicher 2010; Jonason, Koenig, & Tost, 2010; Jonason & Webster, 2010; Miller et al., 2010; Williams, Nathanson, & Paulhus, 2010). These relationships appear to be consistent across different measures of the Big Five, including the BFI (John & Srivastava, 1995; Williams, 2002), and NEO-PI (Costa & McCrae, 1991; Paulhus & Williams, 2002; Veselka, Schermer, & Vernon, 2012). Within this submission, I also use shorter (the BFI-10, Chapter 3), and non-self-report measures, based on the Five-Item Personality Inventory (Gosling, Rentfrow, & Swan, 2003), where others are asked to score Dark Triad personalities for related traits (Chapter 2).

Strong positive correlations have also been found, primarily with Extraversion. This has been reported for the composite Dark Triad (Jonason et al., 2010), and for both narcissism (Lee & Ashton, 2005; Vernon et al., 2008; Veselka et al., 2012) and psychopathy (Paulhus & Williams, 2002). In respect of the other Big Five traits, an overall pattern is somewhat less clear, and requires treating the Dark Triad as three separate components.

For Openness, positive correlations have been reported with the composite Dark Triad (Jonason et al., 2010), as well as narcissism and psychopathy (Paulhus & Williams, 2002). Neuroticism correlates negatively with the Dark Triad (Jonason et al., 2010), as well as with psychopathy (Paulhus & Williams, 2002), but correlates positively with Machiavellianism (Jakobowitz & Egan, 2006; Vernon et al., 2008; Veselka et al., 2012). The overall picture, therefore, is one of a Dark Triad individual scoring high for Extraversion and Openness, but low for Agreeableness and Conscientiousness.

With respect of HEXACO (Ashton & Lee, 2001; Lee & Ashton, 2005), and its additional Honesty-Humility factor, the Dark Triad shows a strong negative correlation. This is perhaps unsurprising, given this trait's pro-social to anti-social spectrum, and the aforementioned nature of the Dark Triad personality.

Measurement

The DT traits have most frequently been measured using the Narcissistic Personality Inventory (NPI, Raskin & Hall, 1979; Raskin & Terry, 1988), the Mach-IV (Christie & Geis, 1970), and the Self-Report Psychopathy Scale (versions II or III) (SRP-III, Paulhus, Neumann, & Hare, 2009). At times, shortened versions of each have been used. Two brief measures assessing each of DT simultaneously have also been created: The Dirty Dozen (Jonason & Webster, 2010), and the Short Dark Triad (SD3, Jones & Paulhus, 2014). Aside from reducing participant burden considerably (from 124 items across the original measures to 12 and 27 items respectively), these short inventories facilitate the simultaneous study of

each trait, allowing researchers to control for overlap and shared variance in analyses. However, the full measures continue to be popular, especially for researchers who are interested in different facets of the component traits, for example, the grandiose/vulnerable division of narcissism (Miller et al., 2011) and the four factors that are considered to constitute psychopathy (Williams, Nathanson, & Paulhus, 2003).

As the Dirty Dozen went unchallenged as a brief measure of DT for several years, and the SD3 is a relatively new measure, it remains to be seen which will achieve prominence in the future. In Chapter 8, I make the case for undertaking psychometric analyses of both measures with and beyond classical test theory. Two further short-form measures may also yet emerge: The Mini-Markers of Evil (Harms, Roberts, & Kuncel, 2004) and the Dark Triad Screening Measure (MacNeil, Whaley, & Holden, 2007), although they have not been presented in peer-reviewed publications at the time of writing.

Evolutionary psychology and individual differences

The purpose of this section is to outline core concepts in evolutionary psychology as they relate to personality and individual differences.

The study of human personality within psychology is one of the cornerstones of the entire discipline, and one of the most well-established: Its origins are as old as the discipline itself. A key reason for the sustained interest and focus personality has received is undoubtedly the apparently infinite variations in traits that represent some of the most striking examples of within-species individual differences. Although humans share a core physiological similarity, personalities are highly divergent (Wiggins & Pincus, 1992; Larsen & Buss, 2008).

However, as Buss (2009) articulates, personality had until comparatively recently received little attention in respect of evolutionary theories. Beyond what Buss describes as a “crude stab” on his part (Buss, 1984; Buss & Penke, 2012, p. 1), there had been little in the way of attempts to align the two theoretical areas. Whilst evolutionary psychology had proven successful at explaining a number of species- and sex-typical adaptations, prior to the last fifteen years or so, researchers influenced by evolutionary theories had seldom given much consideration to personality. Two reasons have been suggested to explain this. First, the absence of strong theories that might explain personality and individual differences with the same clarity and ease as sexual differences (i.e., sexual selection) was prohibitive. In addition, early work that had considered the issue (e.g., Tooby & Cosmides, 1990; Cosmides & Tooby, 2005) had proposed that most (but not all) individual differences were unrelated to functionality, and focused instead on species-typical traits.

Over time, however, and aided by advances in evolutionary genetics, a number of researchers (e.g., Buss & Hawley, 2011; Nettle, 2006; Penke, Denissen, & Miller, 2007; Réale, Dingemanse, Kazem, & Wright, 2010), began to consider how to conceptualise

personality, and its myriad variations, within an expanded “metatheory” of evolutionary psychology (Penke et al., p. 553). Work to unite these fields, and to bring in elements of behavioural ecology (Nettle & Penke, 2010), provided a new framework for conceiving of personality, and specifically of individual differences. I aim to articulate key elements of this framework below, with reference to the Dark Triad.

Selection and individual differences

Darwinian evolutionary theory (1859) holds that, where a trait is advantageous for the survival and reproduction of the organism that possesses it, within its environment, it is naturally selected for across descending generations. Traits that undermine such fitness are, conversely, filtered out of the gene pool. Fisher’s fundamental theorem (1930) suggests that these principles should mean that natural selection reduces variation within a population over generations until only advantageous traits remain, evolutionary pressures “winnowing” away differences (Nettle, 2006). Tooby and Cosmides (1990; 1992) argued that the only traits that should continue to show variation, accordingly, are those that are superfluous to fitness (i.e., they are fitness-neutral), such as eye colour. These non-functional variations have been referred to as examples of evolutionary by-products, or “noise” (Hawley & Buss, 2011, p. ix).

Tooby and Cosmides’ (1990) argument is predicated on the existence of an optimal value within the continuum of any given trait that represents the most advantageous contribution to fitness. However, as Nettle (2007) has emphasized, such universal niches do not exist for key personality traits. Rather than representing a cluster of species-typical traits that are invariant across all humans (e.g., bipedal movement; opposable thumbs), an individual’s personality is replete with differences that distinguish them from others (Larsen & Buss, 2010). Particularly pertinent to this submission are individual differences in levels of narcissism, Machiavellianism, and psychopathy.

Penke et al. (2007) have further pointed out issues with selective neutrality, noting the

abundance of major fitness-related effects of well established, hereditary, personality differences⁶. Evidence has shown that individual differences are typically stable (e.g., McCrae & Costa, 2003), and dependably predict a number of both behavioural and fitness-related outcomes (e.g., Nettle, 2006). To recount Buss and Penke's observation, "individual differences are omnipresent, substantial, and consequential" (p. 3). Individuals also differ within-sex on a number of traits that have shown substantial between-sex differences (e.g., Extraversion; psychopathy). The notion of selection as an homogenizing pressure has therefore received critical counter-arguments over the last decade. Instead, it has been proposed (e.g., Buss, 2009; Penke et al., 2007) that there are other selection mechanisms apt to explain the reason for variation in fitness-related traits. Evaluation of potential mechanisms - selection neutrality, mutation-selection balance, and balancing selection – favours the last of these as the best explanation for variance in personality traits.

Balancing selection holds that selection itself maintains the variation that we can observe in a number of personality traits (Penke et al., 2007). The central premise is that the level of variation that we see in personalities reflects a balance between mutation (which introduces new variants) and selection (which eliminates them) (Nettle, 2006). Personality traits, which Nettle proposes be viewed as "a continuum along which individuals vary", and inferred "though [a person's] behavior" (p. 19), are advantageous at different levels, according to (i) their presence relative to time and environment (Buss, 2009), or (ii) their comparative prevalence within a population (Mealey, 1995).

The first of these is termed *environmental heterogeneity (in fitness optima)*. This type of selection encompasses the idea that different levels of a trait are more advantageous at certain times, and in certain places, than others. At certain points in the evolutionary history of an organism, selection pressures will change in response to time-related incidents (e.g.,

⁶ Research has shown that the DT traits have substantial heritability, ranging between .31 and .72 (Vernon et al., 2008).

drought) or geography. This change in environment will consequently impact traits such that those traits that once represented a positive contribution to overall fitness may fall from selective favour. Importantly, to explain continued variation in such traits, this process must balance, fully, over time and space (Turelli & Barton, 2004).

One frequently-cited example of a manifestation of the effects of environmental heterogeneity is the differing prevalence across geographical areas of the 7R allele of the DRD4 gene, which is associated with dopamine receptors, novelty-seeking, and Extraversion (Munafò, Yalcin, Willis-Owen, & Flint, 2008). The 7R allele seems to be selectively favoured where benefits can be derived from migration, as in nomadic populations (Eisenberg, Campbell, Gray, & Sorenson, 2008), or the environment is already resource-rich (Ding et al., 2002; Wang et al., 2004). Conversely, where an environment is harsh, and resources are limited (increasing the consequences of unfettered risk-taking), the same allele is rare to non-existent (Chen, Burton, Greenberger, & Dimitrieva, 1999; Harpending & Cochran, 2002). It can therefore be considered that particular levels of some traits are more adaptive in certain environments. A further point is that this form of selection operates in a bidirectional manner: Just as some environments affect levels of a trait, some traits may affect the choice of environment (e.g., through migration) (Penke, 2011).

The other form of balancing selection that can explain variation in traits relates to the broad social environment, and the traits possessed by other organisms. This is termed *frequency-dependent selection*. Where an individual's location on a trait continuum is rare within a population (negative frequency-dependent selection), they occupy a strategic niche that has fewer competitors, allowing them an opportunity to thrive: They derive fitness-related advantages accordingly (Bürger, 2005; Maynard Smith, 1983). As previously mentioned, the prevalence of highly-psychopathic individuals within the population is generally considered to be approximately 5% (Mealey, 1995). This low prevalence allows

them to function as ‘parasites’, deriving benefit from others’ undertakings, or else act as ‘predators’ or ‘poachers’, taking advantage of - and taking mates from - others (at least in the short term), for their own benefit, in particular, to increase their own reproductive success. Where traits are related to fitness in this manner, selectively neutrality becomes “largely irrelevant” (Penke et al., p. 549), and Darwinian theory (1859) regarding fitness benefits can be reconciled in terms of net utility. The utility of a particular level of a personality trait is high for the few individuals who possess it as a result of that rarity, and is balanced with the utility of the rest of the low-level individuals within a population.

Building on MacDonald’s (1995) original work, Nettle’s (2007) proposals regarding the comparative advantages and disadvantages of different levels of the Big 5 traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism) derive their theoretical grounding from this balancing selection explanation. The core proposal is that these traits represent evolutionary stable strategies (in that no absolute optimization is possible). Because of the relatively small numbers of individuals categorised by high levels of narcissism, Machiavellianism, and psychopathy, this theory has provided a valuable framework for reflections on the Dark Triad (Glenn et al., 2011; Jonason et al., 2009; Wilson, Near, & Miller, 1996).

Life History Theory

Life History Theory (LHT) also provides a potential framework for the consideration of variation in the allocation of individuals’ effort towards ‘solving’ a range of adaptive problems (Kaplan & Gangestad, 2005), encompassing growth, reproduction, and parental investment. The amount of energy and time available to organisms, including humans, is finite, and cannot be expended on all three; instead, a trade-off must occur. In the case of a focus on reproduction (a ‘fast’ strategy), energy is expended on the pursuit of, appeal to, and mating with as many partners as possible. This potentially produces a comparatively large

number of offspring that, due to weight of numbers, are likely to facilitate the ongoing transmission of familial genes. In the case of parental investment (a ‘slow’ strategy), energy is apportioned to parenting and investing in a relatively smaller number of offspring. However, these offspring are more likely (partly as a result of this investment) to successfully reproduce themselves, thus ensuring genetic continuity. Both strategies therefore represent an approach to the demands of the adaptive problem of reproduction; both strategies occupy different niches. Individuals with high levels of the DT traits have been characterised as adopting a ‘fast’ approach (Figueredo et al., 2009; Jonason, Li, Webster, & Schmitt, 2009; Jonason, Koenig, & Tost, 2010).

Extreme differences between these two approaches were originally conceived of as opposing ends of a spectrum, spanning r (being the maximum growth rate of a population) to K (being the carrying capacity of an environmental setting). This spectrum was originally established to explain between-species variation. Rushton (1985; 1995), however, applied this to within-species variation – though not without controversy. Although, as a species, humans have been considered to occupy a position towards the K end of the r - K spectrum, within-species groups and individuals differ greatly in their r/K allocation. Subsequent years have seen r - K fall somewhat out of favour (e.g., Stearns, 1992), with age-related mortality seen as a more satisfactory explanation for differences in energy investment by others (e.g., Daly & Wilson, 2005).

Nevertheless, LHT and the K -factor, as a superordinate encapsulation of variation in personality traits has remained a potent concept within evolutionary psychology. At least in respect of reproductive strategies, LHT is fairly straightforward: Individuals who allocate their time and energy towards mating rather than parental investment – such as those with high levels of the DT traits – are considered to lead a ‘fast’ life; those who adopt the opposite approach are said to live a ‘slow’ one. Where the optimal strategy for any given individual

lies in respect of investment choices, however, is likely to be predicated on a number of factors: one's life expectancy (encompassing time), and energy, as well as certain aspects of personality (Penke, 2011).

Overview of the current research

As discussed above, there are a number of areas in relation to DT, individual differences, and the evolutionary approach that require further research. In Chapter 2, I explore DT in respect of its attractiveness as a personality (to women). As stated above, although individuals high in DT traits report more sexual success, there had been a lack of research examining the attractiveness of a DT personality; I therefore examine its attractiveness by using characters created to represent high and low levels of the DT traits, and asked women to rate them, rather than extrapolating their attractiveness from self-reported sexual success. Chapter 3 builds on the findings of Chapter 2 by including male participants, rating a female target, and by assessing participants' own levels of the DT traits, to explore what factors may affect the impression of a personality characterised by high levels of the DT traits. Chapter 4 considers the extent to which DT represents an exclusively 'male' approach to life and mating, and looks at similarities between men and women scoring highly for the DT traits in a large, national sample, across domains including competitiveness, sensation-seeking, and mating behaviours. Chapter 5 looks directly at general and sexual competitiveness in women, and explores links between both and the DT traits. Chapter 6 considers the verbal and nonverbal behaviours of men and women characterised by high levels of the DT traits, and the associations between individual traits and specific behaviours. Chapter 7 looks at the health-related outcomes of DT: What health-averse behaviours each trait predicts, and how the traits (differentially) relate to expected lifespan and life tempo. The last of my study-based chapters, Chapter 8, reflects on a popular measure used both to assess DT, and to inform the creation of characters used by myself and

others through the use of a form of psychometric evaluation that goes beyond Classical Test Theory: Mokken analysis. Chapter 9 provides a summary of my undertakings and results, reflects on this submission as a whole, and raises issues regarding the future study of DT.

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Chapter 2

Background

My first study emerged from reservations over existing methodologies used to evaluate sexual success in relation to high levels of the Dark Triad traits in men. The use of self-report measures of lifetime number of partners (e.g., Jonason, Webster, Li, & Schmitt, 2009; McHoskey, 2001; Visser, Pozzebon, Bogaert, & Ashton, 2010; Wryobeck & Wiederman 1999) was felt to be fundamentally problematic. Research has reported that those who have a “status orientation towards sex” equate sexual success with prestige, and hence are likely to “brag” more than other men (Jonason, 2008, p.47). Highly-narcissistic individuals, in particular, seek and value prestige (Raskin, Novacek, & Hogan, 1991). Importantly, they also over-state or over-estimate their own achievements (Paulhus & Williams, 2002). Indeed, individuals characterised by high levels of the DT traits (“high-DTs”) are deceitful, and inclined to cheat and make false claims (Paulhus & Jones, 2012). Thus, an implicit assumption that the self reports of men with high levels of the DT traits regarding their number of sexual partners may be taken as accurate appeared ill-founded – or at least in need of objective confirmation. Perceived attractiveness of personality is a key factor in facilitating engagement in a relationship for both sexes (e.g., Buss & Barnes, 1986). The attractiveness of a personality characterised by high levels of the DT traits, as judged by independent raters, was therefore used as a means of examining whether real-life men with a similar personality might be regarded more positively than individuals who were not defined by these traits (i.e., individuals characterised by empathy, honesty, Conscientiousness, Agreeableness, pro-sociality, and communality), thus supporting claims of greater levels of sexual success.

A recent study (Visser et al., 2010) considered participants’ self-reported number of sexual partners in relation to physical attractiveness within a DT context, but this was limited

to psychopathy, and only used one or two female raters (p. 834). Other research also focused on physical attractiveness relative to DT traits (e.g., Buffardi & Campbell, 2008; Cherulnik, Way, Ames, & Hutto, 1981). Indeed, the apparent attractiveness of individuals with high levels of DT traits had primarily been explained in terms of correlated behaviours pertaining to physical enhancement, such as narcissism-related grooming, narcissism-related self-presentation/promotion and narcissism- and psychopathy-related self-adornment (Buffardi & Campbell, 2008; Holtzman & Strube, 2013). An exploration of whether DT, as a personality constellation, was attractive beyond the effects of physical appeal was warranted.

Since physical attractiveness is critically important in influencing perceptions of potential mates (e.g., Li & Kenrick, 2006; Perilloux, Cloud, & Buss, 2013; Sprecher, 1989), the use of the same male head-shot photograph with purpose-created personality vignettes reflecting individuals characterised by either high, or low levels of these traits would enable this factor to be held constant. Female raters would see and assess the attractiveness of only one of these two vignettes (with half the sample viewing each character); thus their ratings could be unambiguously attributed to the effect of personality, rather than physical appearance. Moreover, in past research, the attractiveness of DT had been examined in relation to its constituent traits individually; a character expressly representing all of the three traits had not been assessed⁷. In addition, researchers have not always provided a control (low-scoring) character condition to compare the relative attractiveness of high and low levels of the traits (Rauthman & Denissen, 2014; Rauthman & Kolar, 2013⁸).

The formulation of high- and low-DT self-descriptions was therefore an important element of the study presented below. Objective assessment was required to assess whether

⁷ For expanded thoughts on issues regarding assessment of a 'core' DT vs. individual traits, see the post-paper reflection.

⁸ These authors acknowledge that their assessment of a 'narcissist' vs. a 'Machiavellian' vs. a 'psychopath' only allows for relative comparisons, but also note that "narcissism, Machiavellianism and psychopathy rarely occur in isolation" (p. 584).

raters perceived the 'high-DT' and 'low-DT' characters as different from one another⁹. This too was an attempt to make methodological improvements over earlier studies of DT perception that had not asked raters to assess created characters' differences, affirming or undermining their methodology accordingly (e.g., Rauthman & Kolar, 2013). Since raters have shown an ability to detect narcissistic, Machiavellian, and psychopathic aspects of personality at limited exposure (Buffardi & Campbell, 2008; Bradley & Kohn, 1987; Cherulnik et al., 1981; Rauthmann, 2012; Vazire, Naumann, Rentfrow, & Gosling, 2008), the validity of the character descriptions was checked by asking raters to assess them on DT traits. This was conducted following participants' assessment of the attractiveness of the character, in order to obtain a 'first-impression' response to their appeal. Had these questions been posed before raters judged the character's attractiveness, their judgement might have been biased by enforced reflections on their personality.

For reasons of comprehensibility, participants were not asked to evaluate our characters as 'narcissistic', 'Machiavellian', or 'psychopathic' per se, since these terms are not widely used and/or may suggest psychopathology. 'Machiavellian' is an unfamiliar term to many, as it largely depends on historical and literary (or psychological) knowledge; 'psychopathic' may suggest a clinical level of the trait. Instead, single-item proxy measures were used in relation to the traits' defining characteristics, as detailed in the 'Procedure' section of the paper.

Participants also rated the characters on the Five Factor ('Big Five') personality traits (Costa & McCrae, 1992). Because the DT traits have been found to correlate with low Agreeableness and Conscientiousness (Furnham, Richards, & Paulhus, 2013; Jonason, Li, Teicher, 2010; Paulhus & Williams, 2002), confirmation was sought that the created

⁹ The terms 'High-DT character' and 'Low-DT character' are used throughout this Chapter and Chapter 3 by way of shorthand, to refer to the characters created to represent personalities primarily defined by their high/low levels of narcissism, Machiavellianism, and psychopathy.

characters accurately represented a individual with a 'DT personality' beyond a simple assessment of characters' narcissism, Machiavellianism, and psychopathy. A second aim was to establish whether any enhanced attractiveness that might be found for the 'high-DT' character could be explained by Big Five traits.

The use of female raters and male targets was predicated from a body of literature that has positioned DT as driving and facilitating a 'male' (short-term) mating strategy (e.g., Jonason et al., 2009). Additionally, the previous finding that men typically outscore women on levels of narcissism, Machiavellianism, and psychopathy (an important factor in the argument for DT as a 'male mating strategy' perspective) has meant that DT men have been the predominant focus of this field of research.

This study therefore represents a first foray into a body of literature that, at the time the paper was conceived and written, was on the cusp of expanding at an exponential rate. It was intended to provide a novel methodology for this area of study, and to explore whether evidence existed for any fundamental attractiveness of a DT personality.

The study is presented below as it appears in its published form. Following the paper, I have dedicated a section to reflection upon its contents, allowing me to consider the findings of Study 1 in a wider context - existing literature; subsequent research – than is practical within the confines of a discussion section constrained by journal word limits¹⁰.

¹⁰ I adhere to this format throughout this submission.

Abstract

It has been suggested that the Dark Triad (DT) personality constellation is an evolved facilitator of men's short-term mating strategies. However, previous studies have relied on self-report data to consider the sexual success of DT men. To explore the attractiveness of the DT personality to the other sex, 128 women rated created (male) characters designed to capture high DT facets of personality or a control personality. Physicality was held constant. Women rated the high DT character as significantly more attractive. Moreover, this greater attractiveness was not explained by correlated perceptions of Big 5 traits. These findings are considered in light of mating strategies, the evolutionary 'arms race' and individual differences.

¹¹ Carter, G. L., Campbell, A. C., & Muncer, S. (2014). The Dark Triad personality: Attractiveness to women. *Personality and Individual Differences*, 56, 57-61.

1. Introduction

In light of sex differences in the Dark Triad (narcissism, Machiavellianism and psychopathy), it has been proposed that this trait constellation may represent an evolved male adaptation for short-term mating. If so, this personality should be attractive to women: we test this hypothesis in the present study. Past studies indicate that DT has strong associations with the Big Five personality factors; consequently, it is possible that any increased attractiveness of these men may result not from their DT qualities, but from associated personality correlates. This is also examined.

Short-term mating is considered more evolutionarily adaptive for males than females, due to males' higher fitness variance and lower obligate parental investment (Buss & Schmitt, 1993). Although women may be prepared to engage in uncommitted mating where 'good genes' represent a trade-off for lack of investment (Gangestad, 1993), casual sexual encounters for women involve a number of potential costs (pregnancy; infection; physical injury) resulting in them typically being less predisposed, evolutionarily, to casual sexual congress than men.

Successful pursuit of short-term mating by men is largely dependent on their attractiveness to women. In short-term contexts, women (like men) place a high value on facial and bodily attractiveness (e.g., Van Dongen & Gangestad, 2011), and evidence suggests the DT and its constituent traits are associated with higher physical attractiveness (Holtzman & Strube, 2010; Visser, Pozzebon, Bogaert, & Ashton, 2010). However, less attention has been paid to the role of the DT personality in attractiveness. Outside the laboratory, visual impressions are modified in light of further information, often derived from conversations with the target. In the present study, we therefore hold physicality constant to examine the extent to which women are attracted to the DT personality. We first review the component traits in relation to sex differences and men's mating strategy, before examining the DT itself.

Narcissism is defined by a sense of entitlement, dominance and a grandiose self-view (Raskin & Terry, 1988). Virtually all studies report greater narcissism in men, including cross-culturally (Foster, Campbell, & Twenge, 2003). Holtzman and Strube (2010) propose that narcissism emerged in response to problems posed by the adoption of a short-term mating strategy in men. Adaptive narcissistic solutions include a willingness and ability to compete with one's own sex, and to repel mates shortly after intercourse. Narcissists find it comparatively easy to begin new relationships, perceive multiple opportunities available to them, and are less likely to remain monogamous (Campbell & Foster, 2002; Campbell, Foster, & Finkel, 2002). Narcissistic men also have more illegitimate children than those scoring lower for the trait (Rowe, 1995). Campbell and Foster (2002) report that male narcissists groom and advertise wealth and resource provision in a manner attractive to women (Vazire et al., 2008). Perhaps as a consequence, other-rated levels of physical attractiveness are positively correlated with narcissism (Holtzman & Strube, 2010; 2013).

Machiavellians are interpersonally duplicitous (McHoskey, 2001a), insincere (Christie & Geis, 1970) and extraverted (Allsop, Eysenck & Eysenck, 1991). Men score higher than women on Machiavellian traits (Lee & Ashton, 2005; McHoskey, 2001b). Machiavellianism is associated with social manipulation and opportunism, both beneficial to the pursuit of short-term mating. Machiavellians report a tendency towards promiscuous behaviours and love-feigning (McHoskey, 2001b). Machiavellian men also report more sexual partners (including affairs), earlier sexual activity, and are inclined towards sexual coercion (McHoskey, 2001b).

Psychopathy consists of callousness, a lack of empathy, and antisocial, erratic behaviour (Hare, 2003). Men show higher levels of sub-clinical psychopathy than women (Lee & Ashton, 2005). Reise and Wright (1996) propose that psychopathic traits (lack of morality; interpersonal hostility) are beneficial to a short-term strategy and are correlated

with unrestricted pattern of sexual behaviour. Psychopathy is further associated with superficial charm, and a deceitful and sexually-exploitative interpersonal style (Paulhus & Williams, 2002). Psychopathy is significantly correlated with a larger number of self-reported sexual partners, long-term relationship breakdown, earlier age of first intercourse, and self- and female-rated physical attractiveness (Visser et al., 2010).

The Dark Triad is the collective term for these moderately inter-correlated, self-interested traits (Paulhus & Williams, 2002). Common to all three are extraverted behaviours likely to make a good first impression, such as a tendency to socialise and to talk about friends. All three overlap in exploitation, manipulation and self-importance (Lee & Ashton, 2005). Consistent with findings for the constituent traits, the composite Dark Triad is positively correlated with number of self-reported lifetime sex-partners, preference for an unrestricted, short-term mating style and high rates of mate-poaching (Jonason, Li, Webster, & Schmitt, 2009; Jonason, Li, & Buss, 2010). It has been suggested that, for men, the Dark Triad “reflects an evolutionarily stable solution to the adaptive problem of reproduction” (Jonason et al., 2009, p. 13; see also Paulhus & Williams, 2002).

However, the majority of studies have employed self-report measures of the DT (or its components) and mating successes. Given the value attached to casual sexual experiences by young men in Western cultures, it is very possible that reported correlations reflect a tendency for DT men to over-report their success in this domain, commensurate with their high self-esteem and willingness to deceive. Studies which have used observer ratings of the DT components have focused exclusively on physical attractiveness (e.g., Holtzman & Strube, 2010). We therefore examine whether women find the Dark Triad *personality* attractive, independent of physical appearance.

Researchers have also considered how the DT may be conceptualised within existing personality frameworks – specifically, the Big Five (Lee & Ashton, 2005). It may be that the

DT's attractiveness to women is a result of correlations with other personality traits, including the Big 5 dimensions. In short, women may simply find DT correlates attractive, rather than the DT itself. However, previous studies of correlations between Big Five scores and DT components do not suggest that the DT personality is a very attractive one. With regard to Agreeableness, evidence to date shows significant negative correlations with narcissism, Machiavellianism, and psychopathy (Jakobwitz & Egan, 2006) and the DT as a whole (Paulhus & Williams, 2002). Conscientiousness and Neuroticism are negatively correlated with the component traits and the DT as a whole (Lee & Ashton, 2005; Jonason, Li, & Teicher, 2010; Lee et al., 2012), whilst Openness correlates positively with the DT (Jonason, Li, & Teicher, 2010; Paulhus & Williams, 2002). Extraversion is also positively correlated with the DT, narcissism and psychopathy, but less so with Machiavellianism (Lee & Ashton, 2005; Paulhus & Williams, 2002; Jonason, Li, & Teicher, 2010). These results are based upon self-reported psychometric assessments, whereas our study will assess the extent to which these correlated traits are apparent to others. It allows clarification of whether the attractiveness of DT men stems from observers' appraisals of the DT qualities themselves, or from correlated personality dimensions.

Vignettes have previously been used to examine the attractiveness of the three subcomponents of DT personalities (Rauthmann & Kolar, 2013). Participants read about an opposite-sex individual who scored highly on four items associated with narcissism, Machiavellianism, or psychopathy on the 'Dirty Dozen' measure of the DT (Jonason & Webster, 2010). These bogus characters were rated for attractiveness, as well as perceived Big 5 scores. However, as the authors acknowledge, they do not present low-scoring characters, so their comparison of attractiveness (with higher scores for narcissism than Machiavellianism and psychopathy) is only between component traits. With no comparison character, there are also no manipulation checks to establish if their characters objectively

manifest the intended traits, and no evaluation of whether perceived Big 5 traits affect attractiveness ratings.

If the Dark Triad has indeed evolved to facilitate short-term mating in men, their presence must be detectable by prospective mates, in some capacity. Individuals demonstrating the trait constellation should also be perceived as more attractive by women. In order to evaluate this hypothesis, the current study will present participants with one of two self-descriptions, developed to represent either a high DT or control individual. Participants will be asked to rate the personality for attractiveness. Participants will also rate the target individual on the Big Five personality factors to establish whether any enhancement in attractiveness rating remains when the effects of any Big Five correlates are removed. It is anticipated that women will rate the high DT individual as more attractive than the control character, that the results will support existing literature regarding the DT's relationship to other personality variables, and that higher attractiveness ratings for the DT character will be independent of associated variation in the Big Five traits.

2. Method

2.1. Participants

One hundred and twenty eight female undergraduates at a British university, (mean age, 19.4; range, 18-36) participated in the study, conducted via online questionnaire. Participants were given course credit for taking part.

2.2. Materials

Two self-descriptions were generated to represent high DT and control men. The high DT self-description contained manifestations of the trait descriptors that comprise Jonason and Webster's (2010) 'Dirty Dozen' measure (a desire for attention, admiration, favours, and prestige; the manipulation, exploitation, deceit and flattery of others; a lack of remorse,

morality concerns and sensitivity, and cynicism)¹². The ‘Dirty Dozen’ is a concise, amalgamated version of the Narcissistic Personality Inventory (Raskin & Terry, 1988), Mach-IV (Christie & Geis, 1970) and Self-Report Psychopathy Scale-III (Paulhus, Hemphill, & Hare, 2009). The control self-description was written to match that of the high DT while omitting these Dark Triad elements (references to pursuits and activities were kept consistent). In order to limit potential bias, the descriptions avoided making reference to attributes found to affect attractiveness ratings, such as resource ownership (Buss & Barnes, 1986) and educational level (Baize & Schroeder, 1995).

2.3. Procedure

After logging on, participants were presented with one of the two self-descriptions (DT or control). Presentation of stimuli was alternated between successive participants. All participants were then asked a series of questions, answered on a six-point Likert scale. The first pertained to the attractiveness of the individual's personality, with the following questions presented in randomised order. As a manipulation check, three questions asked participants to rate the target on narcissism (‘Overvalues their own importance’), Machiavellianism (‘Is manipulative’), and psychopathy (‘Not sensitive to others’ feelings’). Participants then rated the target on the Big Five dimensions as per the Five-Item Personality Inventory (FIPI; Gosling, Rentfrow & Swann, 2003).

3. Results

3.1 Manipulation check

In order to establish that our experimental conditions (the DT and control characters) were sufficiently distinct and were perceived as accurate depictions of different personality types, t-tests were conducted on narcissism, Machiavellianism and psychopathy ratings. The results were significant ($t_{126} = 8.40, p < .001, d = 1.33$; $t_{126} = 10.91, p < .001, d = 1.73$; t_{126}

¹² In this submission, characters are provided as an appendix following the references. In the original publication, they were made available on request.

= 7.06, $p < .001$, $d = 1.81$, respectively), with the DT character rated higher for each trait (see Table 1).

3.2. Attractiveness Ratings and the Big 5

A t-test showed the high DT character was rated as significantly more attractive than the control character ($t_{126} = 5.40$, $p < .001$, $d = 0.94$) supporting our hypotheses (see Table 2).

For the Big Five, t-tests showed the high DT character was rated as significantly lower on Conscientiousness ($t_{126} = -5.19$, $p < .001$, $d = 0.98$), Agreeableness ($t_{126} = -6.00$, $p < .001$, $d = -1.18$) and Neuroticism ($t_{126} = -9.48$, $p < .001$, $d = -1.74$), and significantly higher on Extraversion ($t_{126} = 7.99$, $p < .001$, $d = 1.34$). He was also rated lower for Openness ($t_{126} = -2.29$, $p = .03$, $d = -0.49$), although this did not survive Bonferroni correction for multiple tests ($p < .01$). The full correlation matrix can be seen in Table 3.

3.3. Structural modelling

Our experimental manipulation of the DT traits resulted in higher ratings of attractiveness for the high DT character compared with the control character. However, the manipulation also resulted in differences in ratings on the Big Five dimensions. The High DT character's greater attractiveness could therefore be the result of these correlated differences. Is there a significant increase in the attractiveness of the High DT character, even when the Big Five personality variables are controlled?

We used structural equation modelling to see if the DT manipulation was having an effect independent of the other five personality variables. First, we constructed the best possible model of the Big Five as mediating variables between experimental condition and the dependent variable of attractiveness. Including all five traits resulted in a poor fit ($X^2_{2, 11} = 44.0$, $CFI = .86$). This was improved by removing Openness, Agreeableness, and Conscientiousness. Retaining Extraversion and Neuroticism gave a significantly better fit ($X^2_{2, 9} = 34.6$, $p < .001$) with the following statistics: $X^2_{2, 2} = 9.4$, $CFI = .95$. We then added a direct

path between experimental condition and attractiveness (see Fig. 1); if condition has an effect on attractiveness independent of Neuroticism and Extraversion, the model fit indices should improve. We can also estimate the direct effect of DT condition when the effects of the two personality variables are controlled.

This model was significantly better ($X^2_{2,1} = 6.8, p < .001$) and had excellent fit indices ($X^2_{2,1} = 2.6, CFI = .99$). As Figure 1 shows, both Extraversion and Neuroticism are strongly affected by experimental condition, but their impact on attractiveness ratings is modest and non-significant. Standardised regression weights confirm the significant effect of DT condition on attractiveness remains, independent of indirect effects through Neuroticism and Extraversion. The total effect of DT condition on attractiveness ($\beta = .43, p < .001$) remained significant ($\beta = .30, p = .02$) after partial mediation by Extraversion and Neuroticism.

We repeated the above analysis using the average of the participant's ratings of the three DT qualities in place of experimental condition. Once again, the fit was excellent ($X^2_{2,1} = 1.68, CFI = 1$). In this case, the indirect effects were stronger ($\beta = .19$ compared with $\beta = .13$), so the direct effect of DT on attractiveness after controlling for Extraversion and Neuroticism was weaker ($\beta = .19$). Nonetheless, both analyses indicate that the DT has a significant effect on attractiveness, independent of its effects on Big Five traits.

4. Discussion

No previous studies, to our knowledge, have considered the attractiveness of the Dark Triad personality constellation to the other sex. Past research has demonstrated that the DT is associated with self-reported mating success and increased number of sexual partners; however, these findings are subject to the criticism that the association is an artefact of DT individuals' proneness to deceit; narcissists, in particular, over-claim (Paulhus & Williams, 2002). Our results, though, demonstrate that the DT personality is indeed attractive to women.

The results of our study are also largely in keeping with attempts to map the Dark Triad on to the Big Five traits – albeit through observers’ perception of the Dark Triad personality rather than psychometric self-report. All three components have repeatedly been found to correlate negatively with self-reported Agreeableness (e.g., Jonason et al., 2009); in the present study, women rated the DT individual as less Agreeable than the control character. While this may seem to mitigate attractiveness, low Agreeableness has been found to correlate with higher levels of casual sex for both men and women (Trapnell & Meston, 1996). Women also perceived the Dark Triad character as lower in Conscientiousness and Neuroticism, and higher in Extraversion than the control, echoing similar findings from self-reported studies (Paulhus & Williams, 2002; Lee & Ashton, 2005; Jakobwitz & Egan, 2006; Jonason, Li, & Teicher, 2010).

The structural equation model makes it clear that the DT personality’s attractiveness is not explicable solely in terms of associated Big Five trait perceptions. Although DT men are perceived as lower in Neuroticism and higher in Extraversion - and these qualities do explain a significant proportion of their rated attractiveness - other factors beyond these must be at work. What, then, explains the Dark Triad’s attractiveness? There are at least two possibilities. A *sexual selection* explanation suggests women are responding to some indicator of male quality. Women, particularly in respect of short-term mating, may be attracted to ‘bad boys’, possessing confidence, hard-headedness and an inclination to risk-take - all accurate descriptors of Dark Triad men; all attractive to women (Hall & Benning, 2006; Bassett & Moss, 2004).

A second explanation derives from a *sexual conflict* perspective (Chapman, Arnqvist, Bangham, & Rowe 2003). Women may be responding to DT men’s ability to ‘sell themselves’; a useful tactic in a co-evolutionary ‘arms race’ in which men convince women to pursue the former’s preferred sexual strategy. This ability may derive from a ‘used-car

dealer' ability to charm and manipulate, and DT-associated traits such as assertiveness (Petrides, Vernon, Schermer, & Veselka, 2011). Men with a DT personality are undoubtedly well-placed to successfully implement such a strategy. The greater latitude in men with regard to parental investment is reflected in their greater variance in sexually-selected morphological and behavioural traits (Archer & MehdiKhani, 2003).

We note that in animal research, others have highlighted the difficulty of disentangling the female choice and sexual conflict proposals of mate preferences (Arnqvist & Rowe, 2005). A female preference may be an evolved contingent choice that enhances her reproductive success, or it may be the result of exploitation by males in the evolutionary time lag before females have evolved a response. In either case, we are not asserting that female respondents who rated the DT character as attractive would necessarily be willing to engage in sex with them. However, our findings do indicate that the DT personality is attractive to our participants. This in turn supports previous work that has suggested DT men are more sexually successful.

We acknowledge limitations in the present study. Participants were all undergraduate students, a youthful population more short-term in their relationship orientation. We have assumed that the current sample viewed our characters with a primarily short-term perspective, but this conclusion should be supported by follow-up work. Replication with a community sample would be valuable, as would assessment of the characters' appeal as short- versus long-term mates. We did not enquire whether our participants were currently engaged in relationships, nor did we assess their sociosexual orientation. These and other variables associated with the status of respondent could be usefully pursued in future work. Women low in Agreeableness are more likely to engage in casual sex than Agreeable women (Trapnell & Meston, 1996), and may recognise - and find attractive - DT men. The menstrual cycle may also increase the attractiveness of DT individuals, given its documented effect on

the short-term mating preferences of women (e.g., Gangestad, Garver-Apgar, Simpson, & Cousins, 2007).

Regarding our characters, our DT character manifested all the points of Jonason and Webster's (2010) 'Dirty Dozen' prototype whilst the control character manifests none of them. In the population at large, individuals vary not only along a DT continuum, but also in the relative weighting of the DT subcomponents. Previous research has reported that the relationship between the DT component traits is complex, with varying degrees of correlation between them, ranging from non-significance ($r = .17$ between narcissism and Machiavellianism; Lee & Ashton, 2005) to very strong ($r = .70$ between psychopathy and Machiavellianism; Jacobwitz & Egan, 2006). This suggests a complicated, variable intertwining of the components. A design manipulating a range of DT subcomponent weightings would be useful. Real-world choices, such as dating websites or personal advertisements (which could be assessed for DT indicators) would also be valuable. A speed-dating study, examining women's responses to high and low DT men, could provide valuable behavioural data.

5. Conclusion

In conclusion, the results of our study demonstrate that the Dark Triad male personality is attractive to women and this effect is not mediated by these men's greater perceived Extraversion or Neuroticism. Further work in the sexual marketplace could usefully pursue interactions (statistical and social) between sellers (Dark Triad men) and buyers (women). Regarding the former, does their attractiveness reside in female choice, or in their capacity to persuade and manipulate? For the latter, does the appeal of Dark Triad charm extend to only a subset of women?

Table 1

Descriptive statistics for ratings

Condition	Narcissism		Machiavellianism		Psychopathy	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
High DT	3.67	1.27	4.56	1.12	3.78	1.43
Low DT	2.17	1.13	2.08	1.43	1.97	1.00
All	2.91	1.41	3.29	1.79	2.87	1.53

Table 2

Descriptive statistics for Attractiveness and Big 5 ratings

Condition	Attractiveness		Openness		Conscientious		Neuroticism		Agreeableness		Extraversion	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
High DT	4.44	1.17	3.27	1.42	3.33	1.19	2.14	1.13	2.81	1.29	4.32	1.13
Low DT	3.34	1.17	3.77	1.03	4.43	1.12	3.97	1.05	4.06	1.06	2.62	1.27
All	3.88	1.29	3.52	1.25	3.89	1.31	3.07	1.42	3.45	1.33	3.45	1.47

Table 3

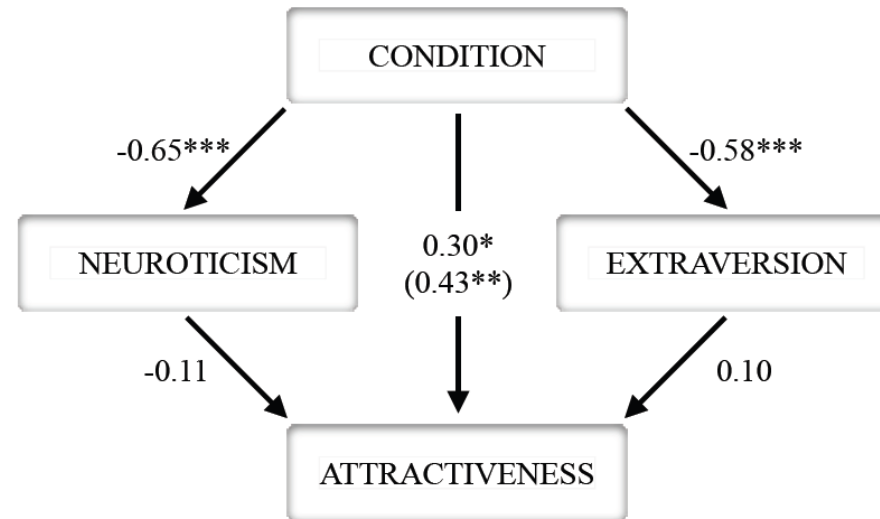
Correlations between the Dark Triad and perceptions of the Big 5

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Dark Triad	-	.83**	.85**	.85**	.37**	.04	-.38**	-.57**	-.29**	.69**
2. Narcissism		-	.53**	.63**	.28**	.20*	-.34**	-.42**	-.23*	.57**
3. Machiavellianism			-	.55**	.32**	-.17	-.34**	-.47**	-.39**	.66**
4. Psychopathy				-	.38**	.12	-.29**	-.56**	-.08	.49**
5. Attractiveness					-	.01	-.17	-.35**	-.04	.33**
6. Openness						-	.05	.02	.28**	.05
7. Conscientiousness							-	.32**	.40**	-.23*
8. Neuroticism								-	.42**	-.46**
9. Agreeableness									-	-.18*
10. Extraversion										-

Note. *Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

Figure 1: Structural Model of the Dark Triad-Attractiveness Relationship



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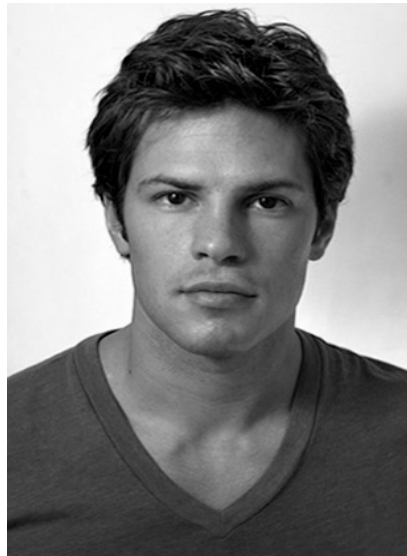
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Appendix

High Dark Triad Character



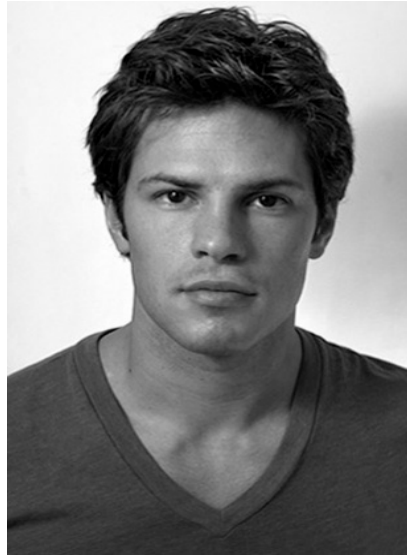
I definitely enjoy getting involved in a range of activities within my community, like sports teams and theatre companies. I like being centre-stage; it's always nice when people value and admire you and what you do. To that end, I've also been quite keen to get involved with the running of the societies and clubs of which I'm a part.

I also don't think there's anything wrong with bending the truth a little bit in those positions if the ends justify it; it's not something I tend to feel guilty about. I'm not pessimistic about these roles; just realistic. I don't think anyone would be hurt or upset in the long run. I don't see it as an especially moral issue – it's just a case of getting the best possible result out of all situations.

Maybe one of the reasons I've been successful is that I seem to be good at persuading others round to my way of thinking, and that I seek to praise them, and their abilities.

I've also been good at calling in favours (or finding ways to get people to lend a hand), in making sure objectives are met.

Low Dark Triad Character



I definitely like getting involved in a range of activities; it's particularly nice to blend in, and be successful as a part of a team. To that end, I've been quite keen to get involved with the societies and clubs in my community although I've never wanted to run any of them myself, as I'd rather avoid the attention that comes with those sorts of leadership positions.

Also, I don't think I'd be comfortable with the truth-bending or deceit that those sorts of position often seem to call for. I guess that makes me a little pessimistic, but that's how I see it. Someone could easily end up hurt or upset; I imagine I'd feel quite guilty about the whole thing, and quite morally-conflicted.

Maybe one of the other reasons I've steered clear of that sort of thing is because I don't seem to be very good at persuading others round to my way of thinking, and I find it a little cringe-worthy to indulge in excessive flattery. I also don't think I'd like to have to call on people for favours, or get others to do things for me.

Reflection

The results of the analyses supported the hypothesis that a male personality characterised by high levels of these traits was attractive to women. After further work and reflection, however, several thoughts have arisen from the content of this paper that bear consideration.

One issue pertains to character creation. An anonymous reviewer suggested that the two characters disproportionately emphasised leadership roles, which they proposed were linked to narcissism, rather than Machiavellianism or psychopathy. However, research has demonstrated that all three DT traits are associated with leadership roles within groups (Deluga, 2001; Emmons, 1987; Lilienfeld et al., 2012), and in the present study the raters demonstrated an ability to detect all three traits distinctly. Furthermore, placing the self-presentation of our characters against a backdrop of leadership roles allowed for a naturalistic incorporation of each of the twelve items from the Dirty Dozen on which the characterisations were based. Other researchers have requested further details of the characterisations used either to attempt replications or to pursue related research questions (Brown; Paterson; Quereshi; Dijkstra; Barelds, personal communications); their results should provide further data on the validity of the characterisations used.

In addition to age, and the connection of youth to a short-term perspective presented in the discussion, other potential reasons for the present results bear consideration. One candidate explanation for the findings above is that they are an effect of ovulation, since existing work has shown that fertile women (in the late-follicular/ovulatory stage of their cycle; also termed “in-oestrus”) have an increased attraction to dominant, competitive, charismatic men (Thornhill & Gangestad, 2008; Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004). This effect has

been studied in respect of the appeal of highly-Machiavellian individuals (Aitken, Lyons, & Jonason, 2013), where it was found that highly-Machiavellian men's appeal was confined to ratings as a short-term partner by ovulating women (compared with non-fertile women or contraceptive-pill users). However, given the size of each group of raters in our study (64 women considered each of our characters), ovulatory cycles would be unlikely to converge (Wilcox, Dunson, & Baird, 2000) so as to create a systematic effect.

It is more likely that raters' own personalities and rating condition could have an effect on their ratings. Durante, Griskevicius, Simpson, Cantú, and Li (2012) found that women with a 'faster' reproductive strategy derived more positive impressions of 'cad' men, and Aitken and colleagues (2013) found a short- or long-term condition to affect raters' impressions of high- and low-Machiavellian men. As noted in the Discussion, follow-up work is needed that expressly considers preferences in the context of short- versus long-term relationships. This forms the basis for a second character study, presented as Chapter 3.

Broader issues related to the appropriateness of studying DT as a composite have also been raised since the publication of this paper (Furnham, Richards, Rangel, & Jones, 2014). As noted in Chapter 1, authors have disputed whether the DT traits are distinct from one another (e.g., McHoskey, Worzel, & Szyarto, 1998), while others have proposed that evaluating narcissism, Machiavellianism, and psychopathy as entirely independent traits also is problematic (Jones & Paulhus, 2009). Both the original article on DT (Paulhus & Williams, 2002) and a recent review (Furnham, Richards, & Paulhus, 2013) support the conclusion that DT have unique elements, yet share a callous-manipulative core (see also Jones & Figueredo, 2013).

Furnham et al. (2014) have argued subsequent to the publication of this work

that DT cannot be examined as a composite entity; the present study presented fictitious high- and low-DT characters, however. An apparent discrepancy in this regard may be best expressed as misunderstanding of principle aims of this study and character construction. First, as noted above, the comparison of ‘dark’ characters (or ‘cads’) with control characters or individuals has been absent from some previous studies (e.g., Rauthmann & Kolar, 2013), which this study redressed. More importantly, however, the high-DT character manifested both core and unique elements of the Dark Triad. In espousing a self-serving, exploitative approach to life and others, as well as indicating a callous nature, the high-DT character reflected the “overlap”, or “core” of a Dark Triad personality¹³ (e.g., Furnham et al., 2014; Jones & Figueredo, 2013); the same character also espouses views that are unique to constituent DT traits. In expressing, for example, a desire to “be centre stage”, and seek admiration, the character presents a narcissistic, rather than Machiavellian or psychopathic attitude. The low-DT character, conversely, expresses sentiments aligned with a communal, honest, and conscientious worldview, as well as reflecting low levels of each of the individual traits (such as not wishing to engage in excessive flattery, ingratiation being a typically Machiavellian tactic: Jones & Paulhus, 2009). Overall, raters’ impressions of the created characters support the assertion that the depictions were valid in respect of both the overlap (in respect of the Big 5) and unique components¹⁴.

¹³ Others have proposed the ‘core’ of DT to be defined by low honesty-humility (Lee & Ashton, 2005), or other conceptualizations based on synonymic descriptors (Furnham et al., 2013). It seems likely that the high-DT character would have been rated low for honesty-humility had this been assessed.

¹⁴ Furnham et al. (2014) refer to “a Dark Triad person”, in respect of someone “predominately a disagreeable, low conscientious, stable extravert” (p.116). Ratings of characters’ Big 5 traits in the present study reflect this; the paper emphasizes and supplies evidence (via modelling) that a DT personality is not reducible to a ‘template’ of this kind, however.

To aid in explaining the logic behind the characters' creation, Figure 1 serves as an illustration of how narcissism, Machiavellianism and psychopathy might overlap, representing a DT core as well as each trait's unique elements. The suggestion is not that the traits perfectly share variance with one another in this manner; rather, the figure below serves as a conceptual frame of reference. As stated, the high-DT character was created to represent the central core of DT, but also to encompass distinct elements of each trait (as assessed by the Dirty Dozen).

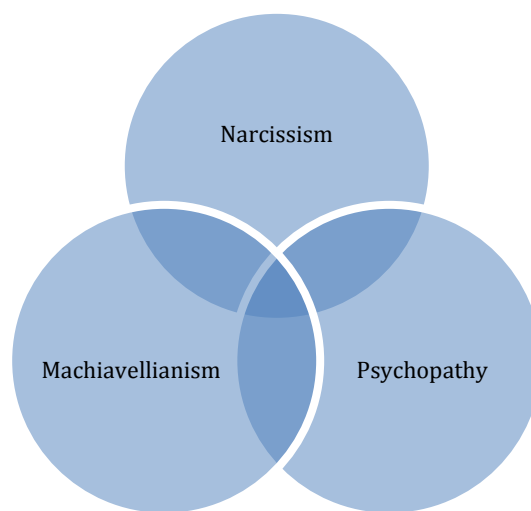


Figure 1. The Dark Triad of personality

Furnham et al. (2014) suggested that “someone being “all three” of the Dark Triad is a theoretical impossibility” (p. 119). This view is predicated on those authors’ perceived quixotism regarding impulsivity: Machiavellianism being characterized by self-control, and psychopathy, conversely, by impulsivity. However, there are at least three reasons why this assertion may be questionable. First, research on the positive relationship between Machiavellianism and self-control/impulsivity has returned inconsistent results (e.g., Jonason & Tost, 2010; Jones & Paulhus, 2011; Chapter 4, this submission). Second, if Machiavellianism is positively related to self-control, it is feasible that the trait could act as a valve, restraining or enabling the expression of

impulsive (psychopathy-related) behaviours. Indeed, Machiavellianism has been defined by its behavioural flexibility (Jones & Paulhus, 2009). It is important to note that personality traits and associated behaviours can be conceived of as contingent environmental responses acting within reaction norms (e.g., Dingemanse, Kazem, Réale, & Wright, 2010; Penke, Denissen, & Miller, 2007). Third, Furnham et al. themselves note that in meta-analysis “the highest mean correlations appear between psychopathy and Machiavellianism” (Furnham et al., 2013, p. 203), acknowledging the empirical overlap and common variance between these traits. As discussed elsewhere in this submission, research on DT should recognise both the distinctive elements associated with the three component traits, as well as the core elements that are shared by them. By this, I mean that if the aim of a research project is to study a variable known to be correlated with or predicted by more than one of the DT traits, all three traits should be studied, and their unique contributions to any outcomes analysed. This is also true for work that considers seemingly unique correlates; unless there is unequivocal evidence to suggest that a particular outcome is only related to one of the DT traits, all three traits should be studied simultaneously. Even in cases where a unique link has been found, replication of such a link would be desirable; this is particularly pertinent in the case of Machiavellianism and psychopathy, since the two share many traits, and the former, as stated, is often inconsistent in respect of significant relationships (see Chapter 1).

In sum, the methodology of the present study was one built on the theoretical reasoning articulated above; the high- and low-DT characters served the primary purpose(s) for which they were created. The next study expands this methodology to assess the potential influence of raters’ personalities and to evaluate whether DT attractiveness is dependent on the nature (short- or long-term) of the relationship

being considered.

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Chapter 3

Background

To explore the issue of DT attractiveness further, an additional study was undertaken using the characters created in Chapter 2. The characters were retained since their differences in respect of DT and broader personality had been validated by participants' ratings. The methodology was expanded in several respects, however. First, male participants were included, and high-DT and low-DT female characters were created that featured the same self-descriptive text as in the previous study but had a woman's headshot. As before, this headshot was the same for both characters, neutralising the effect of physicality. Second, questions to assess the attractiveness of the presented character as both a short- and long-term partner were introduced. Measures of respondents' own personalities were also included. In the previous Chapter, reasons for women's greater attractiveness ratings for a male high-Dark Triad character were considered. One potential explanation was that raters' own DT levels might be a factor, particularly given that two elements of a DT personality are a high sociosexual orientation (Ali & Chamorro-Premuzic, 2010; Jonason, Kavanagh, Webster, & Fitzgerald, 2011; Foster, Shirira, & Campbell, 2006) and low levels of Agreeableness (Paulhus & Williams, 2002; Jakobwitz & Egan, 2006), both of which are related to increased levels of short-term mating. A logical course of enquiry was therefore to assess raters' own DT levels. Thus, participants in this second study were asked to complete the Dirty Dozen (Jonason & Webster, 2010), to provide a measure of their own DT levels.

Several outcomes were possible. One potential outcome was that participants of both sexes, scoring high and low for the DT traits, would rate the high-DT character as more attractive than the low-DT character across both relationship types.

In short, that there would be a strong main effect of DT personality. If so, it could more confidently be asserted (beyond the results of Chapter 2) that DT, as a personality construct, had an inherent appeal independent of physicality, or self-adornment. However, if attractiveness ratings were found to be specific to rater sex, personality, and/or relationship length (or any interaction of these), the contingent nature of DT attractiveness could be articulated in respect of other factors.

Alternatively, although not in keeping with the results of the first study (Chapter 2), participants might not express any preference for the high-DT character across either a short- or long-term scenario. This would suggest an explanation beyond these factors would be required for the earlier results.

Ultimately, a varied pattern of ratings seemed more likely than simple effects, and the study's hypotheses were founded on two basic premises: First, that raters with high levels of the DT traits would recognise the high-DT character as a sexually short-term-oriented personality similar to themselves and find them attractive for a short-term relationship, and less (or not at all) attractive for a long-term relationship. Second, that raters with low levels of the traits would prefer the high-DT character to the low-DT character across both short- and long-term contexts. If found, this would suggest individuals with low, but not high levels of DT, were vulnerable to believing the high-DT character is a more viable long-term partner than research indicates they are (Jonason & Kavanagh, 2010; Jonason, Li, Teicher, 2010; Jonason, Li, Webster & Schmitt, 2009; Jonason, Valentine, Li, & Harbeson, 2011).

The way in which attractiveness ratings for each character as a short- and long-term prospect related to raters' levels of DT would shed some light on the issue of the extent to which high-DT characters are accurately evaluated as potential partners by the majority of the population, who are typically characterised by low(er)

levels of DT. If raters with low levels of DT were attuned to the high-DT character's personality, and understood the likely implications for the prospects of a long-term relationship, they would likely either (i) prefer the high-DT character (over the low-DT character) only for a short-term relationship or (ii) rate the high-DT character as less attractive for a long- than for a short-term relationship. This would suggest they might be aware of the long-term unsuitability of such individuals, and their own potentially vulnerability to exploitation.

If participants with lower levels of DT rated the high-DT character favourably as a potential long-term partner (over a potential short-term partner, or as a more desirable long-term partner than the low-DT character), it would indicate a willingness to engage in a relationship where they would be at risk of being abandoned or cheated on, either because (i) they felt they could change that individual over time¹⁵, and/or (ii) found the prospect of a relationship with such a character to be an exciting prospect. In this instance, the high-DT character (if a real partner) would experience the benefits they seek, suggesting a successful 'con'. The results of the present study would, it was hoped, give formative insight into this complex issue, and thus help establish the direction that future research might take¹⁶.

An additional intention was to explore the long-term partner preferences of participants with high levels of DT. Despite their prevailing short-term orientation, it seemed plausible that at least some of these individuals, given a suitable prospective partner, would favourably consider a longer-term relationship. This was based on the hypothesis that an individual high in the DT traits might rate an individual with low

¹⁵ There is some formative evidence to suggest that narcissistic individuals may change over time (Finkel, Campbell, Buffardi, Kumashiro, & Rusbult, 2009).

¹⁶ Real-world data, in particular, would be enlightening; the created characters can only provide so much information, since raters' evaluation of them does not capture a truly 'interactive' scenario (where high-DT individuals might disguise, obfuscate, or otherwise offset their personality relative to a potential long-term relationship).

levels of DT more favourably than an individual with comparable levels of DT to themselves as a long-term partner. Given background research regarding the deceptive and exploitative aspects of DT personalities, it was anticipated that high DTs might see low DTs as being more easily deceived (or more willing to tolerate deceit) regarding a high-DT partner's trait-typical sexual transgressions (Campbell, Foster, Finkel, 2002; Jones & Weiser, 2014; McHoskey, 2001; McNulty & Widman, 2014¹⁷). Individuals with high levels of DT may select a mating strategy best suited to their circumstances, especially in light of the behavioural flexibility that is a feature of the DT trait constellation (in particular, of Machiavellianism). However, despite a preference for short-term relationships, there is no reason to expect homogeneity in this respect. A long-term partner with low levels of DT could provide a dependable 'base' for a individual with high levels of DT, who could engage in more wide-ranging and extra-pair sexual operations with little or no consequence. These various considerations were the basis for the four hypotheses presented at the end of the Introduction section.

A final rationale for the present study was the notion that DT represented a 'male' mating strategy. This suggestion depends on almost entirely on the application of Bateman principles (Bateman, 1948) and allied conceptualisations of sex-specific mating strategies. A number of human evolutionary researchers (Buss & Schmitt, 1993; Gangestad & Simpson, 2000; Li & Kenrick, 2006; Schmitt, Shackelford, & Buss, 2001) have empirically challenged the notion that short-term mating is an advantageous strategy exclusively for men; animal and modelling studies provide

¹⁷ Findings in this area are somewhat varied, however. Campbell and colleagues, and McNulty and Widman have connected infidelity to narcissism; Jones and Weiser did not find the same, but rather that cheating on partners was related to psychopathy, in men, and psychopathy and Machiavellianism in women. Further, McHoskey (2001) found it to be related to Machiavellianism in men, but not women. The overall impression therefore, that whilst trait-specific links are somewhat inconclusive, there is a link between DT and infidelity.

ample evidence that there are advantages for female short-term mating (e.g. Head, Hunt, Jennions & Brooks, 2005; Kokko, Brooks, Jennions, & Morley, 2003). Therefore, there seemed no theoretical reason that men and women with high levels of DT would significantly differ in their approach to the character/relationship length scenarios. The examination of sex differences in ratings therefore formed an important part of the present study, which is presented below. It is followed by a section that reflects upon its contents within the wider context of DT literature.

Abstract

Past work on the Dark Triad (DT: Sub-clinical narcissism, Machiavellianism and psychopathy) has reported the trait constellation's attractiveness as a personality type and its facilitation of a ('male') short-term mating strategy. The current study ($N = 209$) explores men and women's mating preferences for short- and long-term relationships with one of two opposite-sex targets: One characterized by high levels of DT traits (representing an agentic, 'cad-like' individual), and one, by low levels of the traits (representing a communal, modest, and honest person). Preferences were investigated as a function of participants' own levels of DT traits. Contrary to expectations, there was no significant effect of character or rater level of DT traits, nor any significant effect of interactions between any of these variables. For short-term attractiveness ratings, analyses showed only an effect of gender: Men gave higher ratings than women. For long-term attractiveness ratings, the same pattern was found, with the singular exception that highly-Machiavellian raters gave lower scores than individuals with low levels of this trait. These findings are discussed in relation to the mate choice implications of DT and broader literature. We also make suggestions for future work in this field.

¹⁸ Carter, G. L. & Campbell, A. C. (2014). *The Dark Triad and mating preferences*. Unpublished manuscript, Department of Psychology, University of Durham, Durham, U.K.

1. Introduction

The Dark Triad (DT) is the collective term applied to the three sub-clinical personality traits of narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002). Whilst moderately intercorrelated, each trait has its own distinct attributes. Narcissism is defined by an exaggerated sense of self-importance and need for success in competition with others (e.g., Raskin & Terry, 1988). Machiavellianism reflects the endorsement and use of interpersonally manipulative and exploitative tactics (e.g., Christie & Geis, 1970). Psychopathy represents a callous, emotionless, and impulsive personality that lacks empathy (e.g., Hare, Neumann, & Widiger, 2012). All converge on certain core characteristics: A manipulative, callous, and self-serving approach to life and relationships that affords little in the way of concern for others (Jakobwitz & Egan, 2006; Jones & Paulhus, 2011; Lee & Ashton, 2005; Miller et al., 2010).

Despite the fact that individuals characterized by high levels of the DT traits score low for Agreeableness and Conscientiousness (Jakobwitz & Egan, 2006; Jonason & Webster, 2010), they can nonetheless achieve high status that brings substantial rewards: An expanding wealth of literature records narcissists' attainment of leadership roles, Machiavellians' resource-acquisition skills, and the 'successes' of sub-clinical psychopaths (Brunell et al., 2008; Czibor & Bereczkei, 2012; Maccoby, 2000; Mullins-Sweatt, Glover, Derefinko, Miller, & Widiger, 2010). Perhaps relatedly, men scoring highly for DT traits report more lifetime sexual partners (Jonason, Li, Webster, & Schmitt, 2009; Holtzman & Strube, 2013; McHoskey, 2001; Visser, Pozzebon, Bogaert, & Ashton, 2010). Other correlates, such as the endorsement of tactics intended to shut down undesirable relationships (Jonason & Buss, 2012), and higher rates of mate abandonment (Jonason, Li, & Buss, 2010), have been taken to

indicate that DT facilitate a short-term mating strategy which has been presented as advantageous for men (Carter, Campbell, & Muncer, 2014a; Holtzman & Strube, 2010; Jonason et al., 2009). This view is predicated on males' typically lower obligate parental investment, and the reproductive advantages accruing to those males who are successful in securing short-term sexual access to them (Trivers, 1972).

Although the advantages of short-term mating for men are well-documented, others have articulated numerous benefits of short-term mating to women. Short-term mating can be beneficial to females of many species, including humans (Greiling & Buss, 2000; Jennions & Petrie, 2000; Schmitt, Shackelford, & Buss, 2001; Thornhill & Gangestad, 2008). A woman may be able to acquire "good genes" for her offspring (Gangestad, 1993; Li & Kenrick, 2006) and produce "sexier sons" through short-term mating, since men of higher genetic quality are less likely to make long-term investments (Schmitt, 2001). Indeed, high-quality genetic material may be the most (or only) beneficial aspect of mating with such men, since those scoring highly for DT are typically ill-suited to long-term relationships (Jonason et al., 2009; Horan, Guinn, Banghart, 2015). Multiple mateships also ensure genetic diversity in a woman's offspring as a form of bet-hedging. The evolution of male sexual jealousy and sperm competition further suggests that female mating strategies have not been consistently or exclusively monogamous (Goetz, Shackelford, Platek, Starratt, & McKibbin, 2007). These facts, taken together, lend considerable currency to the notion that DT in women, as well as in men, may facilitate short-term mating.

A focus on popular male examples of DT characters (e.g., Jonason, Webster, Schmitt, Li, & Crysel, 2012) and a failure to disaggregate male and female data in some studies have resulted in women with high levels of these traits being overlooked. However, given that two-way sexual selection is characteristic of humans

(Stewart-Williams & Thomas, 2013) and that women, especially those scoring highly for DT, are as equipped and inclined to compete for high-value mates as their male counterparts (Carter, Montanaro, Linney, & Campbell, 2015), the preferences of DT women within the sexual marketplace warrant further consideration. Moreover, recent work has also reported similarities in DT-related attitudes and behaviors between men and women (Carter, Campbell & Muncer, 2014b).

All three DT traits are correlated with a higher sociosexuality (Jonason, et al, 2009), a more casual, flexible approach to mating, a self-centred worldview, and an aptitude for ending existing relationships and beginning new ones (Jonason, Li, & Buss, 2010). Accordingly, individuals with these attributes may adopt different strategies when presented with potential partners who are similar or dissimilar to themselves. Although targets who score high and low for the DT traits both represent mating opportunities for a narcissistic, Machiavellian, and (or) psychopathic individual, different personalities could make them best-suited to different relationships. Potential partners also characterized by high levels of the DT traits are likely to have a similar perspective (on sex) and a comparable (short-term) approach to relationships. Thus, they could be judged ideal short-term partners. Prospective mates with low levels of these traits would be more suitable for a longer (if non-monogamous) relationship. Such a partner could provide a reliable ‘base’, offering dependable sexual access over time with a lower likelihood of abandoning the relationship. A partner characterized by low levels of DT may be less likely to suspect infidelities and, if discovered, may be more easily placated or more tolerant of these ‘darker’ behaviours. An individual with high levels of the DT traits could readily exploit a long-term relationship with such a partner. In the context of a short-term relationship, individuals low in the DT traits may be seduced by the superficial charm

and captivating personality often exhibited by those high in DT, preferring them over low-scoring individuals as short-term partners.

The current study sought to expand existing work in testing for effects of (i) participant sex, and (ii) individual's own DT personalities, on ratings of the attractiveness of characters with high and low levels of the DT traits as short-term or long-term partners. Our hypotheses focused on predicted interactions between participants' DT levels and the target they rated in respect of the target's attractiveness as a short- or long-term partner. Our predictions were based on the versatile and self-serving approach to mating that is more typical of individuals with high, rather than low, levels of the DT traits. We expected to find an effect of one or more DT traits in predicting the attractiveness of the DT character for a short-term relationship due to the compatibility of rater and target in respect of short-term mating focus, and ease of sexual access. We also expected that participants' DT levels would affect their ratings of the DT character such that they would find them less attractive than the control character as a long-term partner, due to the likelihood that a such an individual would be intolerant of their partner's infidelity, more likely to be unfaithful themselves, and more ready to abandon a long-term relationship. A partner with low levels of the DT traits might be regarded as faithful, exploitable and easily deceived regarding cheating.

Relative to individuals with low levels of the DT traits, we anticipated that our results would reflect the potential ability of individuals with high levels of the DT traits to seduce others, and/or low-DT raters' (unrealistically) optimistic view of the DT character as representative of a viable long-term partner. In this respect, we expected that participants with low levels of the DT traits would rate the DT character as more attractive than the control character as a short-term partner (due to the

deceptive yet charming veneer that characterizes DT and acts as a façade for their less desirable traits). Similarly, we predicted that participants with low levels of DT would rate the DT character as more attractive than high-DT participants as a long-term partner in part due to the character's perceived charm, but chiefly because low-DTs are less equipped than DTs to recognize the fidelity and commitment problems of the DT character in a long-term relationship. If these relationships emerged, we hypothesized that they would not differ by sex. Last, we also expected that, in keeping with women's higher demands for mate quality (e.g., Kenrick, Sadalla, Groth, & Trost, 1990), women would report lower ratings for attractiveness than men across contexts.

2. Method

2.1 Participants. Two hundred and thirty-nine participants were recruited via email to participate in an online questionnaire. After excluding non-heterosexual participants (this study being focused on heterosexual mating attitudes and behaviours), 209 respondents remained. The final sample consisted of 109 women and 100 men, aged 18-31 ($M = 19.8$, $SD = 1.62$).

2.2 Materials.

The Dirty Dozen (Jonason & Webster, 2010) is a concise inventory that assesses the DT personalities. It is derived from the Narcissistic Personality Inventory (Raskin & Terry, 1988), Mach-IV (Christie & Geis, 1970) and Psychopathy Scale-III (Paulhus, Hemphill, & Hare, 2009). The questionnaire is composed of three four-item subscales each measuring one of the three component DT traits. Participants indicate endorsement on a nine-point Likert scale across 12 statements including 'I want others to admire me' (narcissism), 'I tend to manipulate others to get my own way' (Machiavellianism) and 'I tend to be unconcerned with the morality of my actions

(psychopathy). It has proven reliable, despite its brevity, and all three sub-scales had a good internal consistency in the present study (narcissism, $\alpha = .72$; Machiavellianism, $\alpha = .81$; psychopathy, $\alpha = .79$).

Four characters, consisting of a headshot and brief self-description were created to represent men and women with high levels of the DT traits (the DT character) and with low levels of the same traits (the control character) (Carter, Campbell & Muncer, 2014a). The DT self-description was derived from twelve manifestations of the trait descriptors that comprise Jonason and Webster's (2010) Dirty Dozen measure, centered on a callous, self-serving personality type. The control characters' self-description was written to match the DT characters' as closely as possible in terms of structure, with a juxtaposed personality type, emphasizing honesty, morality and empathy. The two self-descriptions were paired with the same picture of a man or a woman of the opposite sex to the participant. Because the headshot image was identical across the two characters for each sex, attractiveness ratings are entirely based on characters' personalities, rather than physical attractiveness.

2.3 Procedure. After providing demographic information on age, sex, and sexual orientation, participants were presented with one of two opposite-sex characters representing either the DT or the control individual. All participants were then asked the same questions regarding the attractiveness of the individual's personality ("How attractive would you find this person for a short-term relationship?" and "How attractive would you find this person for a long-term relationship?"). Participants scored the character on a six-point Likert scale (1 = *Not very attractive*; 6 = *Very attractive*). Participants subsequently completed the Dirty Dozen. They were then de-briefed, thanked for their time, and provided with contact details, should they wish to withdraw their data at a later time.

3. Results

3.1. Dark Triad scores. Descriptive statistics for respondents' DT scores are presented in Table 1. Men scored significantly higher than women for narcissism and psychopathy. There was no sex difference in Machiavellianism. This has been reported in previous work (Biggers, 1977; Carter, Campbell, & Muncer, 2014b; Chonko, 1982; Mostafa, 2007). Considering effect sizes (d), neither the difference in men and women's scores for narcissism or Machiavellianism meet the effect size threshold for a meaningful difference (Cohen, 1988).

3.2 Ratings of Attractiveness. In order to test for the potential effects of each of the measured variables on short- and long- attractiveness, we conducted regression analyses. Regressions were run separately for short- and long-term attractiveness ratings, with respondent narcissism, Machiavellianism, and psychopathy scores, respondent sex, and target character (DT/control) entered as predictors in the first step. Mean-centred interaction variables (sex with character, sex with each of three rater traits and character with each of the rater DT traits) were entered into the second step.

Regression statistics are presented in Tables 2 (short-term) and 3 (long-term). For the short-term condition, gender explained a significant amount of the variance in participant ratings. Simple tests showed that significantly higher ratings of short-term attractiveness ($t(1, 207) = 2.35, p < .05$) were given by men ($M = 4.13, SD = 1.07$) than by women ($M = 3.76, SD = 1.30$). There were no other significant predictors. For long-term ratings, gender again explained a significant amount of the variance in participant ratings. Simple tests showed that significantly higher ratings of long-term attractiveness ($t(1,207) = 3.44, p < .001$) were given by men ($M = 3.95, SD = 1.25$) than by women ($M = 3.32, SD = 1.31$). Additionally, raters' Machiavellianism scores

accounted for a significant amount of the variance ($\beta = -.24, p < .01$). Across both short- and long-term attractiveness models, none of the variables of character, narcissism, or psychopathy, nor any of the interactive variables were significant.

4. Discussion

The only result that directly met our expectations was the finding that women gave lower ratings for short- and long-term attractiveness (regardless of target or their own personalities) in keeping with women's higher demands for mate quality across contexts (e.g., Kenrick et al., 1990; see also Jonason, Valentine, Li, & Harbeson, 2011). This reflects the greater reproductive consequences of female mate choice. Our other hypotheses were not supported. With the exception of highly-Machiavellian participants' lower ratings for a long-term relationship prospect (regardless of gender and target DT level), the Dark Triad did not affect raters' judgments of targets' attractiveness.

The lack of a significant difference between the attractiveness ratings of our characters (across short- and long-term scenarios, and participant personalities) casts doubt on the notion of an inherent short-term appeal of a DT personality type, at least as manifested by our character. Evidence from other studies that have assessed DT attractiveness using third-party ratings is conflicting. Some studies have found DT to influence attractiveness ratings: Aitken, Lyons and Jonason (2013) investigated Machiavellianism (using dating advertisements) across short- and long-term conditions and found a preference for high-Machiavellian 'cads' as short-term mates over low-Machiavellian 'dads', who were preferred as long-term partners. In another study that simultaneously manipulated DT traits, Carter et al. (2014a) found a student-aged sample of women rated a high-DT character more "attractive" than a low-DT character. Dufner, Rauthmann, Czarna, and Denissen (2013) explored narcissism in

terms of “sexiness” ratings by friends and others, and found that, while highly narcissistic individuals were considered attractive, this was mediated by physical attractiveness and social boldness. Rauthmann and Kolar (2013) compared narcissistic, Machiavellian, and psychopathic character vignettes, although narcissism was found to be the most attractive of the three for short- and long-term relationships, the authors note their characters were “not perceived as particularly appealing people” (p. 585).

Ultimately, it seems that a high-DT personality may not be *inherently* attractive. The results of the present study (and others) instead suggest that circumstantial factors and aspects of the rater’s own lifestyle, beyond DT, may be key determinants in any perceived attractiveness – and resultant sexual success - of DT personalities. Cycle effects are one possibility, as they have been found to impact women’s ratings of “cad” and “dad” men (Aitken et al., 2013; see also Durante, Griskevicius, Simpson, Cantú, & Li, 2012). Recent work (Lyons, Marcinkowska, Helle, & McGrath, 2015) has additionally proposed that individuals’ own sociosexuality, as well as (for men) a highly opportunistic approach to mating may influence perceived attractiveness. Another possibility is that the attractiveness of DT individuals lies in characteristics that cannot be captured by the written description used in this study, such as their interpersonal style and impression management. In real life, individuals scoring highly for DT may speak and act in ways that are endearing, or attractive, at least in the short term. Preliminary research regarding their speech style and use of nonverbal signals suggests this is the case (Carter, under review).

Attention has recently fallen on sex differences in DT trait scores (Baughman, Jonason, Lyons, & Vernon, 2014; Carter et al., 2014b; Giammarco & Vernon, 2014).

James, Kavanagh, Jonason, Chonody, and Scrutton (2014) reported higher female scores in composite DT score. Women were higher on all three traits, with the significant difference driven by narcissism (Kavanagh, personal communication). This disappeared when age was controlled, however. Other studies have returned non-significant differences in narcissism scores (Jackson, Ervin, & Hodge, 1992). Further studies with non-student samples may prove informative to ongoing discussions. The sex difference in psychopathy in the present sample was robust, however. Overall, the pattern of limited small-to-medium effect sizes (and/or non-significant results) for sex differences in narcissism and Machiavellianism, but a strong difference in psychopathy is similar to results reported by others (see also Giammarco & Vernon, 2014).

Another issue the current work sought to address was how the DT traits relate to mate choice in women. Existing work suggests women characterized by high levels of DT are apt and inclined to engage in short-term mating (Carter et al., 2014b; Carter et al., 2015). Research also attests to the higher standards of high-DT women compared with high-DT men regarding sexual partners (Jonason et al., 2011). These findings have yet to be extended, or connected to any patterns that may exist in DT women's mating choices. The present results do not suggest that DT traits in women affect preferences of either high or low-DT mates. However, as women's short- and long-term relationship choices are typically strategic (i.e., for reasons of high-quality gene/resource provision), it would be pertinent to continue to explore this issue with the use of real-life examples of potential mates, using both qualitative and longitudinal approaches.

The current work simultaneously manipulated all three DT traits in the creation of the target character. The traits overlap to a considerable extent, and thus

attempts to capture both their common and unique aspects, whilst retaining ecological validity, are challenging. Future work on DT in respect of mate choice could seek to establish whether and how individual DT traits may be positively or negatively related to raters' impressions of attractiveness. Of the three candidates, narcissism appears the most promising in terms of cross-sex appeal (e.g., Rauthmann & Kolar, 2013) but there is evidence that this effect may be driven by physical attractiveness, self-enhancement, and social confidence (e.g., Dufner et al., 2013), which may be a cause or a result of individuals' narcissism.

Conclusion

Research continues to explore the attractiveness, sexual success, and mating patterns that relate to narcissism, Machiavellianism, and psychopathy. The present study has added to research that has examined the attractiveness of DT characters on the basis of ratings by prospective mates, rather than using the more common self-report paradigm, which has been criticized as particularly problematic among high-DT individuals. The search for an explanation as to why individuals with high levels of DT traits succeed in attracting greater numbers of mating partners could usefully move beyond the laboratory to examine real-world behavioural correlates of DT.

Table 1

Descriptive statistics and sex differences for Dark Triad traits

	<i>M</i> (SD)			<i>t</i>	<i>d</i>
	Overall	Men	Women		
Narcissism	4.83 (1.55)	5.07 (1.57)	4.63 (1.51)	2.06*	0.29
Machiavellianism	4.05 (1.65)	4.22 (1.79)	3.90 (1.49)	1.38	0.19
Psychopathy	3.24 (1.45)	3.76 (1.49)	2.77 (1.23)	5.24**	0.72
Dark Triad	4.04 (1.18)	4.35 (1.22)	3.77 (1.07)	3.67**	0.51

Note. * $p < .05$; ** $p < .01$

Table 2

Regression of traits on short-term attractiveness ratings

	<i>B</i>	<i>SE B</i>	β
<i>Step 1</i>			
Sex ^a	-.45	.18	-.19
Character	-.003	.17	-.001
Narcissism	-.07	.06	-.09
Machiavellianism	.01	.06	.02
Psychopathy	-.04	.07	-.05
<i>Step 2</i>			
Sex	-.48	.28	-.20
Character	-.01	.26	-.01
Narcissism	-.14	.10	-.18
Machiavellianism	-.06	.10	-.08
Psychopathy	-.07	.12	-.08
Sex*Character	.05	.37	.02
Sex*Narcissism	-.03	.12	-.02
Sex*Machiavellianism	-.12	.13	-.10
Sex*Psychopathy	.02	.14	.02
Character*Narcissism	-.12	.12	-.11
Character*Machiavellianism	-.02	.13	-.02
Character*Psychopathy	-.06	.14	-.06

Note. ^a indicates $p < .05$

Table 3

Regression of traits on long-term attractiveness ratings

	<i>B</i>	<i>SE B</i>	β
<i>Step 1</i>			
Sex ^b	-.65	.19	-.25
Character	.05	.18	.02
Narcissism	.04	.06	.04
Machiavellianism ^b	-.19	.06	-.24
Psychopathy	.01	.07	.01
<i>Step 2</i>			
Sex	-.79	.29	-.30
Character	-.10	.27	-.04
Narcissism	-.07	.11	-.09
Machiavellianism	-.01	.11	-.02
Psychopathy	.09	.12	.09
Sex*Character	.27	.38	.09
Sex*Narcissism	-.17	.13	-.14
Sex*Machiavellianism	.17	.14	.14
Sex*Psychopathy	.05	.15	.03
Character*Narcissism	-.04	.13	-.04
Character*Machiavellianism	.16	.14	.16
Character*Psychopathy	.08	.15	.07

Note. ^b indicates $p < .01$

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Reflection

The results of the study presented in Chapter 2 suggested an inherent attractiveness of a DT persona to women participants. However, the use of a near-identical methodology in the study above did not replicate these findings, nor suggest any attractiveness of DT relative to a number of factors. Having included raters' own personalities and short- and long- term mating conditions in the present study, it emerged that the attractiveness of DT was not absolute, and did not appear, either, to be related to raters' own levels of DT, nor the length of relationship for which they were being considered.

In an attempt to establish the likelihood that the participants of the study presented in Chapter 2 were viewing the characters in a short-term context, the analysis presented above was re-run with female participants only. A mixed model ANOVA (2 x 2 x 2) was used, where short-term and long-term attractiveness was a repeated measure, and respondent DT (a median split of high/low) and target DT (high/low) were between-subjects variables.

There was a significant main effect of short-term/long-term condition, $F(1, 105) = 9.12, p = .003$, with higher ratings given by women in the short-term ($M = 3.74, SD = 1.30$) than long-term condition ($M = 3.35, SD = 1.31$). This replicated the main effect found using the whole sample. There were no other significant main effects, or significant interactive effects. The implication is that female participants in the present study were primarily interested in a short-term partner. Since the female-only sample used in Chapter 2 were comparable to the present sample in demographic terms (M_{age} , present study = 19.63; M_{age} , Chapter 2 = 19.40), and were drawn from a similar background – i.e., western; highly-educated) it seems likely that the

participants of the previous study also responded to the characters as a potential short-term partner, supporting the assertion made in the Discussion section of that paper.

That the high-DT character in Chapter 2 was regarded as significantly more attractive than the low-DT character (with a large effect size, $d = 0.94$, comparatively unusual in personality literature¹⁹) can now be more confidently explained in the context of raters' likely short-term perspective; why there was no effect of character in the present study, however, remains unclear. Exploring more specific forms of short-term relationships – one-night stands, friends-with-benefits, booty call arrangements (see also: Jonason, Luevano, & Adams, 2012; Jonason, Lyons, & Blanchard, 2015) might yield discernable preferences. In the present study, participants were asked to consider the characters for a generic 'short-term relationship'; in the study presented in Chapter 2, participants were simply asked how attractive they found the characters, meaning the conditions under which they were considering the character were likely to range across individual raters. Given that individuals with high levels of the DT traits are inclined towards a range of sexual fantasies (Baughman, Jonason, Veselka, & Vernon, 2014), restricting consideration of our characters to a 'vanilla' (i.e., conventional) short-term relationship may have limited these raters' interest in the present study.

It is clear that more work is needed in this area. Longitudinal data would be of use in this respect and that qualitative research as to the reasons raters give for their scoring may also yield valuable information. Although actors in the field of human mating are not conscious of the evolutionary pressures which act on them (a sometimes-perpetuated fallacy which harms evolutionary psychology - see, e.g., Winegard, Winegard, & Deaner, 2014), a degree of insight into the thought processes

¹⁹ Although effect sizes of this magnitude have been reported in respect of sex-based differences in psychopathy levels (e.g., Jonason et al., 2009).

of raters regarding their mating choices could be enlightening. It would reduce dependence on post hoc speculation and has precedence in the field of evolutionary psychology (e.g., Meston & Buss, 2009).

A key issue that this study touched upon was sex differences in DT and its correlates. First, despite the use of a student sample (which has typically been found to show sex difference in DT; e.g., Jonason et al., 2009), levels of Machiavellianism did not significantly differ between men and women. Others have reported similar findings (Jonason, Koenig, & Tost, 2010; Jonason & Tost, 2010). Moreover, the sex difference in narcissism, with an effect size of $d = .29$, was below the threshold of a ‘practical’ significant difference (Ferguson, 2009). James, Kavanagh, Jonason, Chonody and Scrutton (2014) have recently reported a reversal in the expected DT sex difference in narcissism, and resultantly, in composite DT for a sample in which men were significantly older (mean age = 45.04; $SD = 13.97$) than women (mean age = 23.04, $SD = 2.15$). However, psychopathy, which has typically shown the strongest sex difference of the DT traits in student samples (Jonason et al., 2010; Paulhus & Williams, 2002; Ross & Rausch, 2001; Visser et al., 2010), was significant in the present study. Additional work, especially with non-undergraduate samples, should continue to monitor and report DT scores by sex.

The current study found no sex difference in attractiveness ratings of the characters in either a short- or long-term context. The only significant sex difference was that men considered both characters more attractive than women, which is in keeping with literature on men’s lower thresholds (‘standards’) for attractiveness in mate choice, especially in short-term relationships (Clark & Hatfield, 1989²⁰;

²⁰ This result has been supported by subsequent studies that also report strong, though not so completely dichotomous, sex differences in receptivity to offers of casual sex (Tappé, Bensman, Hayashi, & Hatfield, 2013; Voracek, Hofhansl, & Fisher, 2005).

Kenrick, Groth, Trost, & Sadalla, 1993). There was no difference in high-DT men and women's mating preferences relative to partner and context, however. The assessment of how DT and sex may interact in respect of fitness-related issues is therefore also warranted in on-going work.

Having included male participants and found no evidence of sex differences in the effect of participants' DT levels on mate choice, the next study had momentum to further explore and potentially validate the nascent theoretical proposal than even if levels of DT typically diverge according to sex (at least in student raters), men and women with high levels of the traits may be extremely similar in their approach to mating. It was anticipated that DT traits would manifest comparably in men and women in respect of additional mating-related correlates and outcomes; this matter is directly assessed in the next chapter.

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Chapter 4

Background

As noted in the reflection section of the previous chapter, the issue of whether the Dark Triad represents and facilitates what has been articulated as an uniquely ‘male’ mating strategy (e.g., Jonason, Li, Webster, & Schmitt, 2009) proves a theoretical sticking-point. Certainly, as outlined previously, a short-term approach to relationships has traditionally been considered more beneficial for men than women, but there is a wealth of evidence (see Chapter 1) that short-term or extra-pair mating can be beneficial to women (e.g., Gangestad & Simpson, 1990; Greiling & Buss, 2000, Hrdy, 1981, Smith, 1984; Symons, 1979).

Individuals characterised by high levels of DT are unlikely to be ‘typical’ of the general population. Negative frequency dependent selection (e.g., Penke, Dennissen, & Miller, 2007; Wilson, Near, & Miller, 1996) would suggest that high-DT individuals represent a small proportion of the population, with high fitness-related benefits relative to costs (Jonason, Li, & Buss, 2010). The study presented in this chapter examined whether this particular population niche, consisting of both men and women high in DT, were similar in their broader personalities and behaviours (e.g., competitiveness, sensation-seeking, the endorsement of recreational sex), and whether the sex differences often found in these outcomes were mediated by sex differences in DT. In light of this, our next research questions were: ‘Do men and women with high levels of DT endorse comparable relationship- and sex-related behaviours?’, and ‘Does DT function as a facilitator of a short-term mating strategy

for women just as it does for men?’²¹.

A large, non-student population was accessed through a survey carried out on behalf of a national newspaper. This national sample included a broad age range of male and female participants, allowing for more widely-applicable analyses and conclusions²². Several areas that related to mating behaviours (and are therefore related to fitness-relevant outcomes), as well as general personality were assessed. These included lifestyle orientation (sensation-seeking, impulsivity, and competitiveness), mating style (the importance of romance, attachment, and sex in relationships), and promiscuous (‘laddish’; ‘recreational’) sexual behaviours, as well as the Big 5 personality traits. I have replicated the study in its published format below, and have appended this with a reflection on its contents.

²¹ In popular terminology, the purpose was to test whether ‘man-eaters’ (or ‘femme fatales’) could be quantified, and were similar to the ‘bad boys’ or ‘cads’ that had been the overwhelming focus of the field to this point.

²² This is not to suggest that work on DT has not been conducted with non-student samples, or that results have not been split by sex. Rather, there was (at the time the data were collected) a limited volume of research that had simultaneously done both, and also focused on these issue as points of particular theoretical relevance.

Abstract

The Dark Triad (DT: Sub-clinical narcissism, Machiavellianism, and psychopathy) is argued to facilitate a male short-term mating strategy. The trait constellation in women and its potential adaptive benefits has received less attention. We examined the prevalence and correlates of DT in a large community sample ($N = 899$). Despite finding expected sex differences in Sensation-seeking, Competitiveness, strength of sexual motivation, recreational sex behaviors and Neuroticism, we found no sex difference in DT scores. Furthermore, within-sex multiple regressions identified the same predictors of DT score with similar weightings. Moderation analysis confirmed regression equations did not differ by sex. We propose that focus on DT as a male adaptation to short-term mating has been overstated and that men’s greater preference for casual sexual encounters is not explained by DT traits.

²³ Carter, G. L., Campbell, A. C., & Muncer, S. (2014). The Dark Triad: Beyond a ‘male’ mating strategy. *Personality and individual differences*, 56, 159-164.

1. Introduction

Evolutionary psychologists have suggested that short-term mating strategies may be more adaptive for males than females. This view is based on the higher parental investment of females which constrains their reproductive output and that of monogamous partners. Polygynous males can attain high reproductive success by inseminating and abandoning multiple females. Polygynous male inclinations have been widely-documented (e.g., Schmitt et al., 2012). Women report a less promiscuous socio-sexual orientation, concordant with their lower fitness variance, obligate parental investment and short-term mating costs (Buss & Schmitt, 1993).

Not all men can successfully pursue polygyny, however. It is high-risk and competitive, requiring individuals to seize sexual opportunities while avoiding emotional engagement. It has been suggested that the Dark Triad (DT) personality (narcissism, Machiavellianism, and psychopathy) is well-suited to this challenge (Jonason & Kavanagh, 2010; Jonason, Li, & Buss, 2010; Jonason, Valentine, Li, & Harbeson, 2011). DT is associated with promiscuity and desire for extra-pair sex. DT men report more lifetime sex partners and hold less restrictive socio-sexual attitudes (Jonason, Li, Webster, & Schmitt, 2009). A DT personality is also attractive to women, independent of a man's physical appearance (Carter, Campbell, & Muncer, 2014). DT is associated with deceptive sexual tactics, including love-feigning (Jonason et al., 2009). It is correlated with mate-poaching (Schmitt & Buss, 2001) and mate- abandonment (Jonason, Li, & Buss, 2010; Schmitt & Buss, 2001).

Recently, however, the view that short-term mating confers few benefits on women has been challenged. Short-term mating can secure fertilization by men of high genetic quality (Smith, 1984). Extra-pair mating can provide an assessment of alternative mates' quality (Greiling & Buss, 2000) and increase the genetic diversity

of offspring (Fossoy, Johnsen, & Lifjeld, 2008). Nevertheless, the alignment of DT with short-term strategies often considered more typical of men has resulted in less attention on the prevalence and correlates of DT in women. We address this in the present article. Research on DT has reported higher male scores for DT (e.g., Jonason et al., 2009). The first aim of the present study is to examine the sex difference in a national sample.

Our second aim concerns correlates of DT in both sexes. In male and female undergraduates, correlations of similar magnitude have been reported between DT and measures assessing standards for long-term mates (Jonason et al., 2011), altruism (Jonason, Li, & Teicher, 2010) and specific social influence tactics (Jonason & Webster, 2010). Sex differences have been found in correlations with sexual tactics or game-playing love styles (Jonason & Buss, 2012; Jonason & Kavanagh, 2010), empathy (Jonason, Lyons, Bethell, & Ross, 2013), forms of impulsivity (Jones & Paulhus, 2011) and friendship choices (Jonason & Schmitt, 2012). However, in many studies, correlations are not disaggregated by sex so we have an incomplete understanding of whether DT correlates constitute different ‘profiles’ in men and women.

In the present study, we compare DT profiles of women and men across three major domains: Mating style (Importance of Romance, Attachment, and Sex in relationships; Recreational Sexual Behaviors), lifestyle orientation (Sensation-seeking; Impulsivity; Competitiveness) and broader personality (Big Five). We have briefly reviewed evidence that, in men, DT is associated with short-term mating strategy markers. This strategy is thought to be mediated by lifestyle and personality characteristics that equip DT men with the psychological tools necessary for its execution. Below, we consider what is known about these correlates in relation to

short-term mating and DT.

1.1. Lifestyle orientation

It is relatively well-documented that DT is associated with higher levels of Sensation-seeking (Emmons, 1991; McHoskey, Worzel, & Szyarto, 1998). High sensation-seekers (attracted to thrill in the face of possible risk) rate potential partners as more attractive and express a stronger desire to date them. They are more inclined to discount the likelihood that a short-term partner may have sexually-transmitted diseases and are more likely to engage in unprotected sex (Henderson et al., 2005). Furthermore, impulsivity (a tendency to act without consideration of long-term consequences) has been associated with short-term and risky sexual behaviors (e.g., Khurana et al., 2012). DT also shows association with self-control levels, future discounting, and dysfunctional impulsivity (Jonason & Tost, 2010; Jones & Paulhus, 2011).

The pursuit of short-term mating involves within-sex competition for mate access (Daly & Wilson, 1988). A recent study confirmed DT is correlated with the adoption of competitive, assertive, and dominating tactics (Jonason et al., 2011). Forms of social influence can be dichotomized into ‘hard’ (threatening, manipulating) and ‘soft’ (charming, ingratiating) tactics. DT is associated with both, but more closely with the former. In a money-allocation task, DT participants were characterized by competitiveness, rather than prosociality or individualism (Jonason, Li, & Teicher, 2010).

1.2. Personality

Relationships between DT and Big Five personality constructs have been well-documented. The most robust finding is the negative correlation between DT and Agreeableness (Paulhus & Williams, 2002; Vernon, Villani, Vickers, & Harris, 2008;

Veselka, Schermer, & Vernon, 2012). DT (Jonason, Li, & Teicher, 2010), psychopathy (Paulhus & Williams, 2002) and narcissism (Lee & Ashton, 2005; Vernon et al., 2008; Veselka et al., 2012) correlate positively with Extraversion. This combination of high Extraversion and low Agreeableness has been proposed to facilitate a short-term mating style (Jonason et al., 2009). Openness correlates positively with DT (Jonason, Li, & Teicher, 2010), narcissism and psychopathy (Paulhus & Williams, 2002), whilst Conscientiousness correlates negatively with DT (Jonason, Li, & Teicher, 2010) Machiavellianism (Lee & Ashton, 2005), psychopathy (Jakobwitz & Egan, 2006; Paulhus & Williams, 2002; Vernon et al., 2008; Veselka et al., 2012) and narcissism (Jakobwitz & Egan, 2006). Finally, Neuroticism correlates negatively with DT composite (Jonason, Li, & Teicher, 2010) and psychopathy (Paulhus & Williams, 2002), but positively with Machiavellianism (Jakobwitz & Egan, 2006; Vernon et al., 2008; Veselka et al., 2012).

Although the constellation of attitudes, behaviors and traits associated with DT individuals seems characteristic of men and ‘male’ mating strategies, women scoring highly for DT do exist. The aims of the current study are (1) to examine sex differences in DT in a large national sample, and (2) determine whether correlates of DT personality (mating style, lifestyle orientation, and Big 5 traits) differ by sex.

2. Method

2.1. Participants. One thousand and three participants were recruited via a marketing company to participate in an online questionnaire. After dropping non-heterosexual participants (this study being focused on heterosexual mating attitudes and behaviors), 899 heterosexual respondents remained. The final sample consisted of 440 females and 459 males, aged 25–55 (mean = 39.5 years).

2.2. Materials

2.2.1. The 'Dirty Dozen' (DD)

The 'Dirty Dozen' is a twelve-item questionnaire that creates an overall DT score (Jonason & Webster, 2010). Participants indicate agreement with statements including 'I have used deceit or lied to get my way'. The inventory contains three four-item sub-scales pertaining to each of narcissism, Machiavellianism, and psychopathy. The DD has proven reliable, considering its brevity, and had good internal consistency in the present study ($\alpha = .75$).

2.2.2. BFI-10 personality inventory (BFI-10)

The BFI-10 (Rammstedt & John, 2007) is a concise measure used to assess the Big 5 with two items pertaining to each of Extraversion, Openness, Conscientiousness and Neuroticism. Following the authors' recommendation, we used a third item to assess Agreeableness given its relevance to DT. Participants rate how accurately each descriptor captures their personality. It has been found valid and reliable (Thalmayer, Saucier, & Eigenhuis, 2011).

2.2.3. Impulsivity and Sensation-seeking (ImpSS)

The 19-item ImpSS scale from the Zuckerman-Kuhlman Personality Questionnaire (Zuckerman & Kuhlman, 1993) was used. Participants answered 'false' or 'true' to statements such as "I usually think about what I am going to do before I do it" (Impulsivity) and "I'll try anything once" (Sensation-seeking). Two separate scales were constructed since Impulsivity and Sensation-seeking have been found to be independent dimensions (Cross, Copping, & Campbell, 2011). (Alpha values: $\alpha = .72$ (Impulsivity) and $\alpha = .82$ (Sensation-seeking)).

2.2.4. Competitiveness

Six items were taken from the Hyper-Competitive Attitude Scale (Ryckman, Hammer, Kaczor, & Gold, 1990). This scale ($\alpha = .66$) included items such as

“Winning in competitions makes me feel more powerful as a person”.

2.2.5. Attitudes towards Romance, Attachment and Sex

Fifteen questions assessing Romance, Attachment, and Sex attitudes were put to participants, who were asked to answer with reference to their current intimate relationship (or a previous one if single). For Romance, five items pertained to thoughts about their partner and desire for union with them ($\alpha = .71$). For Attachment, six items pertained to giving and receiving emotional support ($\alpha = .85$). Sexual attitudes were dichotomized into two items assessing frequency and strength of their sexual desire for their partner (Sexual Desire (Partner), $\alpha = .60$), and two assessing frequency and strength of sexual desire for members of the opposite sex other than their partner (Sexual Desire (Others), $\alpha = .70$).

2.2.6. Recreational Sexual Behavior

The Laddish Behavior Inventory (Muncer & Campbell, 2012) is designed to assess exhibitionistic and boisterous behavior typically associated with ‘laddish’ culture. For the current study, eight items pertaining to sexual behavior were used. The items included: “I prefer sex to romance” and “I have cheated on a boyfriend/girlfriend” (full list available on request). This measure, too, had good internal consistency ($\alpha = .76$).

2.3. Procedure

Participants were asked to provide their sex, age, and sexual orientation. They then completed the Dirty Dozen, BFI-10 personality inventory, ZKPQ Impulsive Sensation-seeking scale, Romance, Attachment and Sex scales, Competitiveness scale and ‘Laddish’ Sexual Behavior Inventory.¹

¹ The design and analyses of this study conform to the recommendations of Simmons, Nelson, and Simonsohn (2011).

3. Results

To examine sex differences, we used MANOVA with sex as the independent variable and 14 scale scores as dependent variables. The multivariate effect of sex was significant, $F(13, 742) = 14.75, p < .001$. Univariate descriptive statistics and tests are presented in Table 1.

Strikingly, the sex difference in DT was not significant, although men scored marginally higher than women ($d = 0.12$). Because previous studies have used younger samples, we examined the sex difference for DT in those respondents aged 30 or under ($n = 188$). The result was non-significant, $F(1, 186) = 0.01, p = .91$. The bulk of the remaining sex differences replicated those reported by others. Women scored higher than men on Neuroticism ($d = -0.25$) and Conscientiousness ($d = -0.21$), whilst men scored higher on Competitiveness ($d = 0.32$) and Sensation-seeking ($d = 0.27$), with moderate effect sizes. No sex differences were found for Impulsivity ($d = 0.03$). The largest effect size was for Sexual Desire (Others) ($d = 0.83$) and there was a significant though less extreme sex difference for Recreational Sexual Behaviors ($d = 0.34$). Regarding intimate relationships, men scored significantly higher than women on Sexual Desire (Partner) ($d = 0.37$), although men and women did not differ in feelings of Romance ($d = -0.12$) or Attachment ($d = -0.05$) toward partners.

We then examined correlations between DT and mating style, lifestyle orientation and personality variables as a function of sex (Table 2). The pattern was remarkably consistent across sex. In neither sex was DT associated with partner-directed Romance, Attachment or Sexual Desire. However, in both sexes, DT was positively and significantly correlated with the extra-partner variables: Sexual Desire Others and Recreational Sexual Behaviors. In both sexes, DT correlated positively with all three measures of lifestyle orientation: Impulsivity, Sensation-seeking, and

Competitiveness. With regard to the Big Five, DT was associated positively with Extraversion and negatively with Agreeableness in both sexes. For women only, DT was negatively correlated with Conscientiousness. These results are broadly in keeping with existing literature on DT and its relationship with other personality constructs.

The similarity between the sexes in the direction and magnitude of correlations was marked, and suggested DT has similar predictors in the two sexes. Nonetheless, given the possibility of different inter-correlations between variables in men and women, we performed regression analyses separately.

Because age was weakly correlated with DT ($r = -.07, p = .04$), we controlled for age in the regression analyses by entering it in the first step, followed by all predictor variables in step two. (A regression in which age was not controlled resulted in the same set of significant predictors.) Results are presented in Table 3.

The final models explained 41 percent of the variance in women and 35 percent in men. Results were extremely similar: In both sexes, DT was associated with greater Impulsivity, Competitiveness, and Recreational Sexual Behavior, and with lower levels of Agreeableness. These four variables were the only significant predictors in both sexes. We therefore conducted a moderation analysis to confirm respondent sex did not moderate the relationship between the predictors and DT (Frazier, Tix, & Baron, 2004). To do this, we added sex-by-variable interaction terms in the final step of a hierarchical regression. The addition of interaction terms did not improve the model, $\Delta R^2 = .003, p = .36$, confirming men's and women's models did not differ. Evidence of moderation by sex was absent for Impulsivity $\beta = .01, t = .24, p = .81$; Competitiveness $\beta = -.01, t = -.35, p = .73$; Agreeableness $\beta = -.08, t = -1.06, p = .29$), and Recreational Sexual Behavior $\beta = -.13, t = -1.75, p = .08$.

In previous work (Jonason et al., 2009), DT has been found to partially mediate sex differences in short-term mating strategy. Although we found sex differences in Sexual Desire (Others) and Recreational Sexual Behavior, DT was not tested as a mediator because the requirement of a significant correlation between the independent variable (gender) and mediator (DT score) was not met.

4. Discussion

Our data demonstrate that (1) in a large national sample, there is no significant sex difference in DT levels and (2) the correlates of DT personality are nearly identical in the two sexes. We consider these in turn.

In the main, our pattern of sex differences replicated those previously reported. Men scored higher than women on Sensation-seeking and Competitiveness, and showed stronger sexual motivation, reflected in stronger Sexual Desire (for Partner and Others), as well as Recreational Sexual Behavior. We found no sex difference in Impulsivity in line with a recent meta-analysis suggesting Impulsivity and Sensation-seeking are conceptually and empirically distinct, with sex differences confined to the latter (Cross et al., 2011). Women scored higher than men on Neuroticism and Conscientiousness. Despite this replication of established sex differences over a range of measures, we found no significant sex difference in DT scores. Given our large sample, with ample power (85%) to detect even a small effect size ($d = .20$), the absence of a sex difference merits consideration. Many previous studies have used undergraduate samples. Younger age is associated with a riskier lifestyle, particularly among men. This has been dubbed ‘Young Male Syndrome’ (Wilson & Daly, 1985). To the extent that DT is correlated with (or is a manifestation of) that syndrome, sex differences might be expected to be most apparent at younger ages. However, when we restricted our analysis to respondents aged 30 or younger,

there was no evidence of a sex difference. Nevertheless, we acknowledge that our youngest participant was aged 25, compared with average ages between 21 and 24 in previous DT studies (Jonason & Tost, 2010; Jonason et al., 2009). College students differ from the general population not only in age, but on a range of measures including individualism and internal locus of control (Henrich, Heine, & Norenzayan, 2010). Despite this, they account for two-thirds of participants used in psychological studies in the United States. As noted (Jonason & Buss, 2012), studies of DT in relation to demographic indicators such as gender require large community samples, preferably with a wide age range, for valid generalizations.

In men and women, DT personality was associated with lower Agreeableness, greater Extraversion and a more Competitive, Sensation-seeking and Impulsive lifestyle. Although DT was not correlated with intra-relationship variables (Romance, Attachment and Sexual Desire (Partner)), it was positively correlated with extra-relationship variables (Sexual Desire (Others) and Recreational Sexual Behavior). This suggests the main impact of DT on mating strategy is on casual sexual adventures. Indeed, for both sexes, correlations between DT and Recreational Sexual Behavior were among the highest of all. Individuals high on DT do not lack feelings of romance and attachment toward their partners, but they retain a lively interest in extra-pair sexual possibilities. This ‘lust for life’ (or ‘life of lust’) is also manifest in a willingness to act spontaneously and seize opportunities (Impulsivity), to value excitement even when risky (Sensation-seeking), to enjoy social stimulation and interaction (Extraversion), and to embrace interpersonal rivalry (Competitiveness). These motivations sit against a backdrop of low Agreeableness, with a premium on personal satisfaction at the expense of trustworthiness, modesty and compliance. This personality is congruent with a ‘fast’ life history strategy prioritizing immediate

gratification, of which short-term mating is one manifestation (Jonason & Tost, 2010).

Multiple regression analyses for men and women identified the same predictors of DT score with similar weightings, and this was confirmed by moderation analysis. A high degree of similarity between the sexes has been found in previous studies where participants have been disaggregated by sex (Jonason & Buss, 2012; Jonason, Li, & Buss 2010; Jonason & Tost, 2010; Paulhus & Williams, 2002). Indeed, an absence of moderation by sex has been explicitly noted in studies of DT and mating strategy (Jonason & Buss 2012; Jonason et al., 2011). Despite this, researchers have emphasized DT personality constellation as especially relevant to men's mating strategy (Jonason et al., 2009). For example, Jonason, Webster, Schmitt, Li, and Crysel (2012) characterize male 'antiheroes' of popular culture (such as James Bond) as classic examples of DT personality. In explaining the apparent paucity of female antiheroes, they suggest "fast life strategies in women are simply manifested through different indicators than for men" (Jonason et al., 2012, p. 197).

In our data, the absence of significant sex differences in DT and its correlates suggests DT may facilitate a short-term mating strategy in much the same way for women as for men. Evolutionary psychology increasingly recognizes strategic pluralism in both sexes (e.g., Schmitt et al., 2012; Thornhill & Gangestad, 2008). Traditional assumptions about sex roles in relation to mating strategies are being challenged: Aspects of the Bateman principles have been questioned empirically (Gowaty, Kim, & Anderson, 2012) and theoretically (Kokko & Jennions, 2008). Multiple mating can bring a range of advantages to females by improving offspring quality, increasing genetic diversity, and exploiting male resources in the short term (Jennions & Petrie, 2000). Women's willingness to engage in short-term relationships may be a form of intrasexual competition whereby sex is used to undercut the

competition: Offering ‘cheaper’ sex, women can gain (temporary) access to highly-desirable mates, with the prospect of retaining some over a longer term (Baumeister & Vohs, 2004). Furthermore, women’s adoption of a short-term strategy is supported by contemporary cultural shifts, including rejection of sexual ‘double standards’ and support for gender equality in private and public spheres.

Notwithstanding the positive association with DT, women in our study were less likely to engage in Recreational Sexual Behavior than men and showed less marked desires for sex beyond current relationships. This is convergent with research showing women’s lesser willingness to engage in uncommitted, casual and short-term sex (e.g., Schmitt et al., 2012). DT has been offered as an explanation of this sex difference in mating preferences, yet our data indicate no sex difference in DT or its personality and life- style correlates. Although DT explained a significant percentage of the variance in Recreational Sexual Behavior and Sexual Desire (Others) in both sexes, it did not explain the sex difference per se. In a previous study in which a sex difference in DT was found (Jonason et al., 2009), DT only partially mediated the relationship between gender and mating strategy; the residual effect of gender remained significant. The most likely candidate linking gender to preferred mating strategy is the marked universal sex difference in sexual drive, including men’s greater desire for sexual variety, willingness to engage in sex after minimal acquaintance and higher preferred rate of intercourse. Our data do not suggest DT traits predispose men more strongly than women to a desire for sexual variety.

Overall, our findings add to calls for the use of larger and more representative samples if we are to develop a fuller understanding of DT. Moreover, the tendency to focus on DT as facilitating a ‘male’ sexual strategy should be reconsidered. Future work could usefully consider manifestations of the Dark Triad in women and give

greater consideration to the benefits of DT personality beyond the domain of mating strategies.

Table 1

Means and standard deviations by sex for all variables

Domain	Measure	Women	Men	<i>F</i>	<i>d</i>
Dark Triad		3.72 (2.55)	4.03 (2.50)	3.41	0.10
Lifestyle orientation	Impulsivity	2.37 (2.13)	2.30 (2.00)	0.23	0.03
	Sensation-seeking	5.08 (3.27)	5.93 (3.09)	16.07***	0.27
	Competitiveness	2.70 (.62)	2.90 (.64)	22.99***	0.32
Mating style	Romance	3.58 (.70)	3.66 (.69)	2.61	-0.12
	Attachment	4.19 (.69)	4.22 (.62)	0.49	-0.05
	Sex Desire (Partner)	4.06 (1.29)	4.51 (1.14)	27.58***	0.37
	Sex Desire (Others)	2.12 (1.40)	3.36 (1.59)	138.70***	0.83
	Recreational Sexual Behaviors	2.53 (1.89)	3.19 (1.99)	26.68***	0.34
Personality	Neuroticism	6.16 (1.83)	5.71 (1.84)	13.58***	-0.25
	Extraversion	5.98 (1.82)	5.78 (1.81)	2.78	-0.11
	Openness	7.24 (1.63)	7.31 (1.61)	0.35	0.04
	Agreeableness	10.94 (1.88)	10.88 (1.76)	0.25	-0.03
	Conscientiousness	7.69 (1.56)	7.37 (1.51)	9.66**	-0.21

Note. ** $p < .01$; *** $p < .001$

Table 2

Correlations between Dark Triad and all variables by sex

Domain	Measure	Women	Men
Lifestyle orientation	Impulsivity	.31***	.30***
	Sensation-seeking	.32***	.29***
	Competitiveness	.41***	.39***
Mating style	Romance	.06	.01
	Attachment	-.08	-.05
	Sexual Desire (Partner)	.06	.05
	Sex Desire (Others)	.23***	.15***
	Recreational Sexual Behaviors	.48***	.37***
Personality	Neuroticism	-.04	-.06
	Extraversion	.17***	.17***
	Openness	.07	.08
	Agreeableness	-.31***	-.30***
	Conscientiousness	-.13***	-.07

Note. *** $p < .001$

Table 3

Multiple regression of all variables on Dark Triad score by sex controlling for age

Variable	Women			Men		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Step 1						
Age	-.03	.02	-.10	-.02	.02	.06
Step 2						
Age	.03	.01	.09	.02	.01	.06
Impulsivity	.16	.06	.13**	.14	.06	.11**
Sensation-seeking	.04	.05	.05	.07	.05	.08
Competitiveness	1.25	.18	.31***	.99	.17	.26***
Romance	.21	.21	.06	.33	.20	.09
Attachment	-.12	.21	-.03	-.11	.22	-.03
Sexual Desire (Partner)	-.03	.10	-.01	-.10	.10	-.05
Sexual Desire (Others)	.01	.09	.01	-.07	.08	-.04
Recreational Sexual Behaviors	.45	.07	.32***	.31	.07	.25***
Neuroticism	.00	.07	.00	-.02	.06	-.01
Extraversion	.01	.07	.01	.10	.07	.07
Openness	.05	.07	.04	.07	.07	.05
Agreeableness	-.28	.06	-.20***	-.39	.07	-.28***
Conscientiousness	.00	.08	.00	-.12	.08	-.07
R^2 Step 1			.01			.00
R^2 Step 2			.41			.35
<i>F</i> full model			17.22***			14.61***

Note. ** $p < .01$; *** $p < .001$

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Reflection

DT had near-identical correlates for both men and women, suggesting that men and women scoring highly for DT are extremely similar in a range of attitudes and behaviours. This finding supports and extends other studies in which correlates of DT did not substantially differ by sex, or where DT significantly mediated sex differences (e.g., Jonason, Li, & Teicher, 2010; Jonason, Lyons, Baughman, & Vernon, 2014; Jonason, Lyons, & Bethell, 2014; Jonason, Jones, & Lyons, 2014; Visser, Pozzebon, Bogaert, & Ashton, 2010²⁴; see also Chapter 6, this submission). The suggestion is not that men and women with high levels of the DT traits are exact mirrors of one another²⁵, but rather that evidence to date suggests that they appear to be more alike than they are different in important fitness-related ways. The implication of the present results is that both men and women scoring high for DT are well-suited to pursue short-term mating strategies. Equipped with an extraverted, disagreeable and competitive nature; driven by impulsivity and sensation-seeking, it seems unsurprising that they would endorse recreational sexual activities. The Recreational (or ‘Laddish’) Sexual Behaviour inventory (Muncer & Campbell, 2012) consisted of items that encompassed approaching members of the opposite sex for relationship purposes, competing with friends for quantity of romantic partners, engaging in games with sexual forfeits, cheating on a partner, and preferring sex to romance. In short, an approach to sex and relationships that is very familiar in respect of a short-term, or ‘fast’ DT style that has been well documented.

It seems likely that women have engaged in short-term mating across human

²⁴ Despite the title of this article, the authors note (importantly, in relation to this study) that their “results suggest that the sexual behaviour correlates of psychopathy are similar for men and women” (Visser et al., p. 837).

²⁵ In Chapters 1, 5, and 9, I refer to different ‘routes’ between DT traits and outcomes for men and women (see also Jonason, Lyons, Bethell, & Ross, 2013).

evolution. Firstly, evidence of sperm competition (e.g., Smith, 1984) suggests that women have repeatedly, over evolutionary history, pursued reproductive strategies beyond homogenous long-term mating. Second, the evolution of male sexual jealousy (e.g., Daly & Wilson, 1988), catalytically evoked by evidence (or suspicion) of female infidelity, negates the likelihood of consistent human monogamy. Lastly, without women's engagement in short-term mating, men would not have evolved a pervasive desire for sexual variety; they would not have had sufficient partners (Buss & Schmitt, 1993; Greiling & Buss, 2000). Infidelity (extra-pair sex) is a frequent context for women's short-term mating, which has been found to characterise high-DT individuals (Brewer, Hunt, James, & Abell, 2015; Campbell, Foster, & Finkel, 2002; Jones & Weiser, 2014²⁶; McHoskey, 2001; McNulty & Widman, 2014), and is also endorsed within the Recreational Sexual Behavior inventory used above²⁷.

Whilst the DT personality that facilitates short-term mating may be similar in certain men and women, the suggestion is that the evolutionary reasons for these behaviours are not identical. There are key differences in the adaptive benefits of short-term mating in women and men. In addition to undercutting competitors for mates, women's short-term mating can function in a number of additional, advantageous ways including: i) securing sperm from men of high genetic quality (the 'good genes' hypothesis: Gangestad, 1993); ii) securing sperm from men of compatible genetic quality (the 'compatible genes' hypothesis: Fossøy, Johnsen, & Lifjeld, 2008); iii) functioning as 'insurance' against a romantic partner's infertility (the 'fertility insurance' hypothesis: Krokene, Rigstad, Dale, & Lifjeld, 1998); and iv)

²⁶ These authors relate DT to infidelity for men and women, but find that different traits explain the connection in men and women, reflecting the 'routes' concept discussed elsewhere

²⁷ McHoskey (2001) found a correlation between Machiavellianism and infidelity only in men. In the present sample, the relationship between the trait and our infidelity item from the Recreational Sexual Behaviour inventory was significant in both women ($r = .35, p < .001$) and men ($r = .27, p < .001$).

switching to a better mate (the ‘mate-switching’ hypothesis: Greiling & Buss, 2000). Meston and Buss (2007) provide an accessible overview of this area; they report multiple additional explanations as to why women engage in certain sexual behaviours; many of these relate to short-term scenarios.

In sum, the dispute is not that the evolutionary drivers of these behaviours differ for men and women, but rather that the present results suggest that high-DT men and women are equipped in the same way to pursue a short-term strategy as befits them differentially. That is why, it seems apt to assert, DT can be said to extend ‘beyond a male mating strategy’.

Further analyses

Another area of consideration relates to the treatment of DT as a composite, rather than as three partially overlapping traits. Recognising the importance of establishing the correlates of individual DT traits (this point is taken further in Chapters 5, 6, and 7), the present data were re-analysed, examining narcissism, Machiavellianism, and psychopathy separately. Table 1 presents correlations between each of the component traits and the measures used in the current study by sex.

Table 1

Correlations between narcissism (N), Machiavellianism (M) and psychopathy (P) by sex

Domain	Measure	Women			Men		
		N	M	P	N	M	P
Lifestyle	Impulsivity	.32**	.25**	.20**	.23**	.34**	.24**
orientation	Sensation-seeking	.28**	.24**	.10**	.25**	.29**	.18**
	Competitiveness	.26**	.36**	.22**	.38**	.33**	.20**
Mating style	Romance	.13**	-.02	-.12**	.18**	-.05	-.03
	Attachment	.04	-.02	-.14**	.01	-.12*	-.09
	Sexual Desire (Partner)	.04	.04	.02	.11*	.02	.03
	Sexual Desire (Others)	.09	.14**	.09	.15**	.23**	.15**
	Recreational Sexual	.27**	.38**	.14**	.30**	.47**	.33**
	Behaviours						
Personality	Neuroticism	-.02	-.08	-.02	-.02	-.07	-.02
	Extraversion	.26**	.15**	-.09	.17**	.18**	-.01
	Openness	.10*	.08	-.02	.10*	.08	-.04
	Agreeableness	-.05	-.27**	-.39**	-.12*	-.27**	-.36**
	Conscientiousness	.02	-.07	-.11*	-.04	-.10*	-.18**

Note. * $p < .05$; ** $p < .01$

These expanded analyses of DT traits support the previous results: All lifestyle orientation correlations were significant for both men and women across narcissism, Machiavellianism and psychopathy. Indeed, the majority of correlations between DT traits and domain variables did not significantly differ across men and women. Even when correlations achieved significance for one sex and not the other (eight instances), the strength of the relationship between the DT trait and domain variable was not significantly different between men and women: Across all 39 correlations, only two relationships significantly differed in strength between men and women. The relationship between recreational sexual behaviours and psychopathy was stronger in men ($r = .33$) than in women ($r = .14$) ($z = -1.47, p = .001$), and the relationship between Competitiveness and narcissism was stronger in men ($r = .28$) than in women ($r = .38$) ($z = 1.68, p = 0.05$). No other results differed in strength when compared across sex. Moreover, in all cases, the direction of the relationship was the same for both men and women.

Beyond the findings reported in the original study, some additional relationships emerge. The endorsement of romantic sentiment was not associated with DT in the original study. However, the re-analysis revealed a positive correlation with narcissism in both sexes and, for women only, a negative correlation with psychopathy. The finding that an endorsement of romantic sentiment has a positive relationship with narcissism is unsurprising, since narcissism alone among DT traits is defined by the need for admiration and recognition by others. It is possible that narcissistic individuals engage in conventional 'romantic' behaviour to increase a partner's admiration for them, thus enhancing their own self-esteem (as highly-narcissistic individuals prefer partners who are inclined towards the admiration of others: Campbell, 1999). Psychopathy, which had a negative relationship with

romance in women, is characterised by a cold interpersonal style and a lack of empathy; psychopathic individuals care little about others' feelings, and view themselves in a relatively solipsistic manner (Williams, Paulhus, & Hare, 2007). An absence of romantic sentiment would seem to reflect that. It is uncertain why this relationship would only exist in women; it is possibly a reflection of psychopathic disdain for others in that the notion of 'romance', often seen as more feminine than masculine (also explaining a lack of correlation with psychopathy in men), is anathema to highly-psychopathic women. Additional research on female sub-clinical psychopathy and romance-related emotions and attitudes is needed. Available evidence to date suggests psychopathy is related to a *ludus*, or game-playing style of love (Outcalt, 2007; Jonason & Kavanagh, 2010), whereas a conventional 'romantic' style would be more akin to an *agape* (unconditional) or *mania* (love-sick) style (Lee, 1973; Hendrick & Hendrick, 1986).

The composite analysis showed several non-significant trends in the association between DT and personality variables. The re-analysis of component traits uncovered additional significant associations. Regarding mating style, feelings of attachment to a current partner were negatively correlated with psychopathy in women and with Machiavellianism in men; sexual desire for a current partner was positively correlated with narcissism in men - though less strongly correlated than sexual desire for others - and sexual desire for others was uniquely correlated with Machiavellianism in women.

In respect of Big 5 correlates: Openness was positively correlated with narcissism in both sexes; Conscientiousness was negatively correlated with psychopathy (in both sexes - when analysing the composite in the previous study, this was unique to women); and Extraversion was positively correlated with narcissism

and Machiavellianism in both men and women. Agreeableness almost mirrored the pattern found for the composite trait, with the exception of a non-significant (but still negative) correlation with narcissism in women. This pattern of results is largely consistent with previous work (Jonason, Li, & Teicher, 2010; Paulhus & Williams, 2002; Vernon, Villani, Vickers, & Harris, 2008), with the exception of the relationship between Machiavellianism and Extraversion. (Machiavellianism has proven the most variable trait amongst DT, however, in relation to both the Big 5 and other personality traits.)

Several conclusions may be drawn from the distribution of results. First, the pattern of correlates across narcissism, Machiavellianism, and psychopathy is very similar for men and women: 80% of results did not differ by sex. Where they differ, they only once show an opposite direction (for narcissism-Conscientiousness); the difference is extremely minimal, however – both correlations are very weak. Across all results, only two differ to a significant extent, and this is in respect of the strength of significant positive correlations.

Second, the original findings regarding correlations between composite DT and key traits that substantially define DT (recreational sexual behaviour, competitiveness, sensation-seeking, and impulsivity) are found also at the level of each constituent trait for each sex. As noted above, Agreeableness also almost perfectly replicated this pattern, being negatively correlated with each DT trait across both sexes, with the exception of narcissism in women. Third, these conclusions taken together support the assertion that DT traits are related to the pursuit of a short-term mating strategy in both sexes. Last, certain correlates of DT are specific to one or two of the constituent traits (i.e., romantic sentiment; attachment), relationships that are occluded in the composite analysis (Furnham, Richards, Rangel, & Jones, 2014).

There remains, however, a core set of correlates that can be described as representing a ‘DT personality’ – which appears to encompass the same lifestyle attitudes for men and women.

These additional analyses allow for an expanded view of ‘core’ DT, as well as highlighting distinctive associations with component traits. At this point, it therefore seems apt to re-visit the visual illustration (Figure 1) provided in Chapter 2 as an abstract representation of a DT personality. Figure 2 presents a conceptualisation of a hypothetical individual in terms of their relative levels of the DT traits. This individual scores highest for narcissism, and lowest for psychopathy. In this particular example, in relation to the present results, the unique narcissism space may contain a positive perspective on romantic sentiment; the overlap between narcissism and Machiavellianism would represent enhanced Extraversion; and the central core area would encompass the common correlates of all three traits: Competitiveness, sensation-seeking, impulsivity, and endorsement of recreational sexual behaviours.

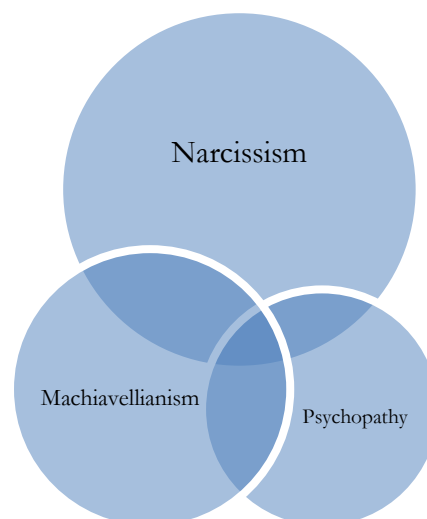


Figure 2. Example of ‘narcissistic’ personality type

The specific relationships elucidated above build upon the originally-reported associations (i.e., the published section of this Chapter) between composite DT score

and other personality and behavioural correlates. These additional analyses allow for an expanded view on the core of DT, in respect of the traits' similarities, as well as on some of the traits' differences (though relatively minimal in the current study) in a way that our original report (i.e., the published section) did not facilitate. In doing so, they support assertions regarding the importance of studying DT traits as connected, yet distinct traits, and explaining outcomes with respect of both individual and shared elements.

The next study seeks to further the exploration of a specific correlate of DT - competitiveness - and examine correlations with both core DT and constituent traits in women, within the context of another fitness-related issue.

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Chapter 5

Background

Reflecting a growing interest in the manifestation of DT in women, the next study exclusively recruited female participants. Not surprisingly, given their wider personality traits, Chapter 4 found evidence that individuals with high levels of the DT traits are competitive (see also Jonason, Li, & Teicher, 2010; Mudrack, Bloodgood, & Turnley, 2012; Raskin & Terry, 1988), but the present study focused primarily on sexual competitiveness. Mating is a necessarily competitive undertaking (Darwin 1871). However, the study of competition within a mating context has proven to be a particularly difficult issue for evolutionary theorists. That is not to say that the subject is impenetrable; rather, that attempts to articulate a distinction between intersexual and intrasexual competition have proven fraught in seeking to disentangle strategies in humans, especially in respect of women.

Buss and Barnes (1986) define intersexual selection as “the tendency of members of one sex to preferentially choose as mates certain members of the opposite sex” (p. 359). Intrasexual competition is “the tendency of members of one sex to compete with another for access to members of the opposite sex” (p. 359). As definitions, these seem distinct. However, many sexually-competitive behaviours are ambiguous in terms of their target – mate or rival – and may share both. To provide a commonplace example: If a woman chooses to wear make-up to an event where potential mates and same-sex rivals will both be present, does this constitute an intersexual tactic? She is advertising youth and suggesting fecundity to potential partners (Grammer, Fink, Møller, & Thornhill, 2003; Mulhern, Fieldman, Hussey, Leveque, & Pineau, 2003; Russell, 2010), which is attractive to men, and increases the likelihood that she will be ‘preferentially chosen’ as a mate. Or is this an

intrasexual tactic? Is she competing, to make herself look comparatively more youthful, or more fecund, than a rival, or potential rivals? ²⁸ A similarly ambiguous issue, drawing on established male preferences (Jasińska, Ziolkiewicz, Ellison, Lipson, & Thune, 2004) can be seen in the choice of some women to wear push-up (or otherwise shape-altering) brassieres²⁹ and/or ‘bodycon’³⁰ dresses. It is entirely possible that such behaviour simultaneously represents both types of competition. This problem arises, in part, because humans are a social species, and mates and rivals therefore often occupy the same spaces.

Another reason for the ‘difficult’ nature of delineating women’s tactics into one type or the other is that women’s aggression more often takes an indirect form, such that rather than compete intrasexually in a physical manner, which represents a considerable threat, they typically engage in practices such as those described above, as well employing gossip and other forms of character assassination (Campbell, 2004; Cross & Campbell, 2011). Thus, what are in fact directly antagonistic behaviours - more easily observable in physically aggressive men - may not be so readily detectable in women, clouding the issue further. We expand on these points further in the Introduction below.

The study employed an inventory derived from Fisher and Cox (2011) in their assessment of what they referred to as ‘strategies for intrasexual competition’. Two of

²⁸ Although we are not focused on men, one pertinent, and equally difficult example, is found in displaying resources (“he flashed a lot of money to impress her” as per Buss, 1988, p. 628). The advertisement and provision of resources is attractive to members of the opposite sex (particularly women); does the presence of a rival with a higher or lower level of resources to advertise make this intrasexual competition?

²⁹ Narcissistic women are known to utilise cleavage display to appear attractive (Vazire, Naumann, Rentfrow, & Gosling, 2008); whether this, or any other tactic, extends to the other DT traits is unclear, as Vazire and colleagues only considered narcissism.

³⁰ This type of dress uses a visual illusion (hence the ‘-con’) to suggest an ideal waist-to-hip ratio (Singh, 1993).

their four tactical groupings (self-promotion and mate manipulation³¹) might be equally or better seen to represent intersexual rather intrasexual competition, although Fisher and Cox referred to all four as examples of intrasexual competition. We selected an equal number of items from each of the original paper's sub-scales, as well as balancing the number of items that focused on mates or rivals as the target, based on the definitional premise that the former represented intersexual competition, and the latter, intrasexual competition. We used factor analysis to assess the underlying structure of the questionnaire items, with the possibility that one, two, or four factors might emerge. We had no 'lumping' or 'splitting' agenda; we simply wished to assess the concept of sexual competition from a factorial perspective, and form our conclusions from the results.

The aims were three-fold. First, to assess whether an established measure of 'intrasexual' competition (Fisher & Cox, 2011) was supported in respect of its four-fold categorisation by the use of factor analysis, or whether an alternative factorial structure would emerge. Second, to establish whether women scoring highly for DT were sexually competitive, above and beyond their general competitiveness (athletic/scholastic competition; broad feelings of competitiveness) as compared with women scoring low for the traits³². Lastly, given the approach taken to DT (highlighted by the Venn diagrams in Chapters 2 and 4), we sought to establish whether competitiveness and sexual competitiveness were 'core' aspects of DT,

³¹ Alongside 'competitor derogation' and 'competitor manipulation'. Self-promotion and competitor derogation were originally described by Buss (1988); Fisher and Cox (2011) added 'mate manipulation' and 'competitor manipulation' to total four strategies for 'intrasexual' competition as a result of the qualitative work that formed the backdrop for their study.

³² In essence, seeking to test whether sexual competition, in whatever factorial structure it emerged, was (as before, using popular terminology) all 'just a part of the game' of broader competition, or whether it was a distinct form of competitiveness, given its implicit fitness-related benefits *viz.* access to higher-quality mates; their resources and their good genes.

related to each of narcissism, Machiavellianism, and psychopathy, or whether the relationship was confined to one or more individual traits. Although Jonason et al. (2010) described DT as a competitive personality, their study (using a resource-allocation task) only revealed a significant correlation with Machiavellianism. Other authors have also focused on the likely relationship between Machiavellianism and a competitive/hypercompetitive personality, worldview, and approach to relationships (e.g., Mudrack et al., 2012³³). Work has also been undertaken on psychopathy: Ross and Rausch (2001) found primary psychopathy to be associated with hypercompetitiveness (and secondary psychopathy negatively associated with cooperation). With some exceptions (Jonason et al., 2009; others noted above), most authors (e.g., Book & Quinsey, 2004; Jonason, Lyons, Baughman, & Vernon, 2014³⁴; Jones, 2013) have focused on attributes or behaviours (such as aggression, interpersonal violence, or lie-telling) that are suggestive of a competitive personality, rather than directly assessing it using established psychometric measures. The study presented in this chapter seeks to directly assess both the general and sexual competitiveness of DT individuals, and in doing so, consider the broader issue of how human inter- and intra-sexual competition is conceived and measured. The published study is presented below, and followed by a reflection.

³³ Mudrack et al. (2012) reported a relationship between Machiavellianism and hypercompetitiveness (that is, competition where victory for the self and loss for others is important); high-Machs showed no such endorsement of personal development competitiveness, however, which is a more respectful form of competition that construes contests as learning opportunities (Ryckman, Hammer, Kaczor, & Gold, 1996).

³⁴ This study was not available when my article was originally submitted, hence its omission from the manuscript.

Abstract

The Dark Triad (DT) of sub-clinical narcissism, Machiavellianism and psychopathy has been found to be related to competitive attitudes and behaviors, chiefly in men. Using a women-only sample ($N = 439$), we examined the relationship of DT with general and sexual competitiveness. Factor analysis indicated that the distinction between inter- and intra-sexual competition in women may be less clear than previously conceptualized. We found significant positive correlations between DT and both general and sexual competitiveness. Regression analyses indicated that DT, and in particular, narcissism, are significant predictors of general and sexual competitiveness. These findings are discussed in relation to evolutionary theory, and directions for future work on sexual competition and DT are suggested.

³⁵ Carter, G. L., Montanaro, Z., Linney, C., & Campbell, A. C. (2015). Women's sexual competition and the Dark Triad. *Personality and Individual Differences*, 74, 275-279.

1. Introduction

Darwin (1871, pp. 254-255) defined sexual selection as “the advantage which certain individuals have over other individuals of the same sex and species in exclusive relation to reproduction”. This advantage is gained through two forms of competition: intrasexual and intersexual. Intrasexual competition refers to competition between members of the same sex for reproductive advantage (Andersson, 1994). Darwin’s view of the female as ‘coy’ in relation to reproduction led to a focus on combat between males for sexual access, with the evolution of male armory such as tusks and horns (‘armaments’, Berglund, Bisazza, & Pilastro, 1996) seen as a direct result of agonistic intrasexual encounters. ‘Coy’ females nevertheless influenced the evolutionary process by their choice of male suitors, since any preference on the part of females for specific traits would act as a selection factor in males (Darwin, 1871). The term intersexual competition has been used to refer to the evolution and display of traits or attributes that are preferred by females. The classic example of these ‘ornaments’ is the tail of the ornately-plumed peacock, *Pavo cristatus* (Berglund et al., 1996).

Since Darwin’s initial observations, it has become clear that biological sex *per se* is less influential in determining reproductive competition than parental investment and the consequent operational sex ratio (Bateman, 1948; Trivers, 1972), as seen in ‘sex role reversed’ species (Jones & Ratterman, 2009). Whilst in most mammalian species, the female is the primary or sole form of support for new offspring, some species – such as humans - feature bi-parental care, in which both parents typically invest heavily in the care of their progeny (Thornhill & Gangestad, 2008). The advent of bi-parental care in humans (an effect of altricial young and lengthy infant dependency) and human monogamy result in two-way sexual selection. Under two-

way sexual selection, both sexes compete for mates. Men become considerably choosier when they make a long-term commitment to a single woman (e.g., Stewart-Williams & Thomas, 2013). This raises issues regarding the roles and relative importance of intrasexual and intersexual forms of competition to men and women.

Intrasexual competition has been widely used as an explanation of male-male aggression. Daly and Wilson (1988) noted the cross-culturally greater proportion of same-sex homicide by men, which they attributed to greater male variance in reproductive success that increased male competition. This, they argued, resulted in a psychological adaptation of combative risk-taking they termed 'young male syndrome' (Wilson & Daly, 1985). In respect of female-female aggression, Campbell (1999) proposed that women's reluctance to engage in direct intrasexual competitive aggression resulted from females' greater parental investment. Whilst, as noted, humans are typically bi-parental carers, the greater dependence of offspring on the mother for survival (Sear & Mace, 2008) has selected for greater avoidance of risk-taking and aggression by mammalian females, including women.

Intersexual competition, by contrast, has been widely used as an explanation of women's typically greater preoccupation with their physical attractiveness. The pursuit and advertisement (illusory or honest) of a healthy and fecund body shape, such as a morphologically ideal waist-to-hip ratio (e.g., Singh, 1993) and a desirable body mass index (e.g., Puhl & Boland, 2001) are examples. In addition, the use of cosmetic products to ornament certain facial features – darkening eyes or eyebrows, for example, to force tonal contrast – enhances the impression of youth (Russell, 2010). Other forms of make-up, used to mask imperfections (uneven skin tone; acne; rosacea) or suggest fertility (pink cheeks; redder lips) are also often rated as attractive by men (Fink, Grammer, & Matts, 2006; Miller & Maner, 2010).

Despite the appealing simplicity of the distinction between intrasexual and intersexual competition, the two forms may not be as discrete as they seem (Berglund, et al., 1996). The distinctiveness of these two forms will be explored in the present study. Daly and Wilson (1988), for example, note that when young men fight, they may do so not to gain direct copulatory access to a desirable mate (intrasexual), but rather to achieve status and respect that may increase their desirability to women (intersexual). The distinction is equally, if not more, questionable in the case of women because of the typically indirect form that their intrasexual aggression takes (Archer, 2004; Björkqvist, 1994; Campbell, 1999). Meta-analyses show that while men exceed women in physical ($d = .39$) and verbal aggression ($d = .30$), the sex difference in indirect aggression is reversed, although the effect size is modest, $d = -.02$ (Archer, 2004). As the riskiness of the form of aggression diminishes, women's willingness to use it rises. Women's indirect aggression has typically been viewed as a form of intrasexual competition (Vaillancourt & Sharma, 2011). Indirect aggression includes stigmatizing rivals (by gossiping to third parties, including men) and tactics of exclusion. Gossip can involve attacks on rivals in areas that are important in men's mate choice, including facial and bodily attractiveness, youthfulness, and sexual restraint (intrasexual competition), but these tactics also enhance a woman's own relative appeal in these areas (intersexual competition). Similarly, excluding a rival from attending a social event where attractive men might be found could be seen as an intrasexual tactic (indirect aggression toward her rival) or an intersexual one (enhancing her likelihood of attracting a mate).

In both the evolutionary and personality literatures (e.g., Fink, Klappauf, Brewer, & Shackelford, 2014; Tooke & Camire, 1991), the term 'intrasexual competition' has been used very broadly, to subsume attitudes and behaviors that

pertain to what would be understood as intersexual competition using Darwin's original formulation. This has included the advertisement of an attractive body shape, engaging in displays that indicate interest in mating, and exerting dominance within a group (Buss & Schmitt, 1993). With this past over-inclusive application of the term in mind, and to clarify our present conceptualization, we will consider tactics of intersexual competition as those that are directed at the opposite sex, and intrasexual competition to encompass tactics directed at same-sex rivals.

Four major forms of sexual competition have been identified in past research. Self-promotion and competitor derogation (Buss, 1988; Schmitt & Buss, 1996) were initially considered the primary forms this competition takes. Later, competitor manipulation and mate manipulation were added (Fisher & Cox, 2011). Self-promotion and mate manipulation both focus directly on the relationship between the individual and potential mate. Because they center on the advertisement of desirable traits, indications of sexual interest, and behaviors likely to be viewed positively by potential mates, they can be considered examples of intersexual competition. Competitor derogation and competitor manipulation both focus on the relationship between the self and rivals, acting in ways that undermine members of the same sex. They can thus be seen as expressions of intrasexual competition.

In their paper on sexual competition, however, Fisher and Cox (2011) propose that all four of these competitive strategies represent 'intrasexual' competition. Whilst they present scales for each tactic that have face validity and good internal consistency, no attempt has yet been made to examine the latent structure of these items using factor analysis. The first aim of the current study is therefore to explore the extent to which, in a large female-only sample, the proposed distinctions in sexually competitive behaviors are supported. Through factor analysis, we seek to

assess whether these tactics emerge as four distinct forms, two composite forms (corresponding to intersexual and intrasexual competition) or one overarching sexual competition factor. We ultimately seek to explore whether we can disentangle tactics of human (female) sexual competition from one another, as existing conceptual frameworks suggest.

The second aim of the present study is to consider women's general and sexual competition in relation to the Dark Triad (DT) and its constituent traits. The Dark Triad is the collective term for the three moderately inter-correlated traits of sub-clinical narcissism, Machiavellianism and psychopathy. Narcissists have a preoccupation with their physical appearance (Campbell, Foster, & Finkel, 2002) and express greater concern over their own attractiveness and beauty than controls (Gabriel, Critelli & Ee, 1994). They manifest this through expensive clothes and accessories, as well as extensive personal grooming (Vazire et al., 2008). Machiavellianism is defined, at its core, by fraudulent interpersonal manipulation and exploitation (Wilson, Near, & Miller, 1996). High levels of psychopathy are associated with a lack of empathy and antisocial, callous behaviors; as with Machiavellianism, psychopathy is related to exploitative strategies (Hare, 2003). Those who score highly for the trait can be convivial in initial encounters, but ultimately, are typically hostile towards others (Reise & Wright, 1996).

DT are correlated with competitiveness and competitive tactics (Carter, Campbell, & Muncer, 2014; Jonason, Li, & Teicher, 2010). All three constituent traits are associated with endorsements of social dominance and related inequalities (Hodson, Hogg, & MacInnis, 2009), reflecting an approval of competition and its (potential) rewards. It is plausible to suggest that narcissism would correlate with intersexual competition, since the attitudes endorsed by high scorers center on self-

advertisement and behaviors designed to impress others (Holtzman & Strube, 2013). By contrast, Machiavellianism and psychopathy might be expected to correlate with intrasexual competition, since the former is defined by interpersonal manipulation and the latter by low levels of empathy, such that the harmful and destructive consequences of derogative, exploitative actions are of little concern (Paulhus & Williams, 2002).

Much work to date has characterized DT as facilitating a ‘male’ mating strategy, particularly as regards sexual attitudes and behaviors (Jonason, Li, Webster, & Schmitt, 2009; Jonason et al., 2010). In consequence, the majority of research been performed on men, or the results have not been disaggregated by sex. The present study aims to redress the androcentrism of previous work. In keeping with existing research highlighting the similarity between high-DT men and women in their attitudes and behaviors (Carter et al., 2014), we predict that narcissism, Machiavellianism and psychopathy individually, and DT as a composite, will be correlated with competitiveness in our female sample as they are in men. We further predict that DT will be correlated with sexual competitiveness. We will also explore specific correlations contingent on the factor structure that is found.

2. Method

2.1. *Participants*

Four hundred and thirty-nine women, aged 17-40 ($M = 22.85$, $SD = 4.76$) were recruited to complete an online questionnaire incorporating measures of the Dark Triad, sexual competitiveness and general competitiveness. They were primarily recruited through a university ‘participant pool’ advertising board (and were given course credit for their participation) and were snowball sampled through social networking sites.

2.2. Measures

2.2.1. The Dirty Dozen

The Dirty Dozen (Jonason & Webster, 2010) is a twelve-item inventory that measures participants' Dark Triad qualities across three, four-item sub-scales. Participants indicate endorsement of statements such as "I tend to seek prestige or status" (narcissism), "I have used deceit or lied to get my own way" (Machiavellianism) and "I tend to lack remorse" (psychopathy). Despite its brevity, the measure had good internal consistency in the current study ($\alpha = .80$). Though only assessed by four questions each from the Dirty Dozen, the internal validity was acceptable for each constituent trait's items (narcissism $\alpha = 0.71$; Machiavellianism $\alpha = 0.63$; psychopathy $\alpha = 0.65$).

2.2.2. Scale for Sexual Competition

A 16-item scale for Sexual Competition was derived from attitudes and behaviors described by Fisher and Cox (2011, pp. 34-38). It was used to measure participants' competitiveness regarding four types of competition: self-promotion (statements such as "I wear makeup to increase my attractiveness to men"), competitor derogation ("I take pleasure in pointing out flaws in other women's appearance"), competitor manipulation ("I would tell another woman that her hair looked nice when it didn't") and mate manipulation ("When I like a man, I make an effort to spend time with his friends"). Four statements were used to assess each type of competition. The alpha for the total 16-item scale was $\alpha = .74$.

2.2.3. Hypercompetitive Attitude Scale

Participants' general competitiveness was assessed with the 17-item, well-validated, Hypercompetitive Attitude Scale (Ryckman, Hammer, Kaczor, & Gold, 1990), which includes statements such as "Winning in competition makes me feel

more powerful as a person” ($\alpha = .89$).

3. Results

Descriptive statistics for all measures are presented in Table 1. We first examined whether the sexual competitiveness items, when subjected to factor analysis, would produce four factors (corresponding to Fisher and Cox’s (2011) typology), two factors (inter- and intra-sexual competition) or one factor (sexual competition).

An oblique (direct oblimin) factor analysis was run for the 16 Sexual Competition items. Results suggested one primary factor, accounting for 23.45% of the variance (Eigenvalue = 3.75). No other factor accounted for more than 10% of the variance. This primary factor was labeled ‘sexual competitiveness’. Loadings for this initial scale are presented in Table 2. Six items loading $<.40$ on this factor (drawn from each of the four potential subscales) were deleted to improve the scale’s internal consistency. Items in bold indicate retention in the final scale. The alpha for this revised 10-item single-factor scale was $\alpha = .78$.

Correlations between all measures are presented in Table 3. Results showed a significant positive correlation between the Dark Triad and both sexual competitiveness ($r = 0.62, p < .01$), and general competitiveness ($r = 0.71, p < .01$). The correlation between these two latter two scales was also significant ($r = 0.57, p < .01$), suggesting a high affinity between general competitive attitudes and behaviors and sexually competitive attitudes and behaviors.

Linear regression showed that sexual competitiveness was significantly predicted by general competitiveness and composite DT scores ($F(2,436) = 151.35, R^2 = 0.41, p < .001$). The coefficient for general competitiveness was $\beta = 0.22, p < .001$, and for DT was $\beta = 0.47, p < .001$. To establish the distinct contribution of

composite DT in predicting sexual competitiveness over and above the effect of general competitiveness, a two-step hierarchical linear regression was conducted. Both models were significant: ($F(1,437) = 189.1, R^2 = .30, p < .001$; $F(1,436) = 151.35, R^2 = .41, p < .001$). The increase in predictive power of the second model over the first was significant ($\Delta R^2 = .11, F(1, 436) = 79.59, p < .001$). General competitiveness, $\beta = 0.55, p < .001$, accounted for 30.2% of the variance in sexual competitiveness with DT, $\beta = 0.47, p < .001$, accounting for an additional 10.8%.

Responses to the Dirty Dozen were then split to provide scores for the component traits of narcissism, Machiavellianism and psychopathy. Stepwise regression was used to establish the traits' relative power in predicting general competitiveness. The model was significant ($F = 157.21, R^2 = .52, p < .001$). Narcissism accounted for 38.1% of the variance ($\beta = 0.43, p < .001$), psychopathy for an additional 10.2% ($\beta = 0.25, p < .001$) and Machiavellianism for a further 3.4% ($\beta = 0.23, p < .001$). Stepwise regression was then used to establish DT traits' relative power in predicting sexual competitiveness. This model, too, was significant ($F = 93.16, R^2 = 0.39, p < .001$). Narcissism accounted for 27.2% of the variance ($\beta = 0.35, p < .001$), Machiavellianism, for an additional 8.6% ($\beta = 0.23, p < .001$) and psychopathy for a further 3.3% ($\beta = 0.22, p < .001$).

4. Discussion

Regarding the first aim of this study, our results do not support clear distinctions between what have previously been termed 'intrasexual' competitive tactics. Items selected to assess self-promotion, competitor derogation, competitor manipulation and mate manipulation (Fisher & Cox, 2011) returned a single-factor solution when subjected to factor analysis. Moreover, our results do not support a sharp division between intersexual and intrasexual competitive behaviors in women.

The difficulties evident in previous attempts to conceptually split these two forms of competition support our findings. For example, Tooke and Camire (1991) judged a set of behaviors relating to “enhanced appearance” as indicative of intersexual competition, although “appearance alteration” was judged to be a form of intrasexual competition. The same issue was manifest with “exaggerated superiority” (identified as an index of intrasexual competition) and “dominance” (judged to be a form of intersexual competition). Even at the individual item level, some behaviors (such as wearing dark clothes to appear thinner, or acting dominant) were classified as both inter- and intra-sexual forms of competition. Moreover, these item clusters were only supported by (limited) face validity: no statistical evidence was offered for the groupings. Therefore, we are confronted with a substantial issue as to how – and even whether – we can disaggregate female intersexual competition (the advertisement of traits desired by men) from intrasexual competition (seeking to disadvantage rival members of their own sex). In our highly social species, this is a challenging issue.

It may be that the inter-/intra-sexual distinction is absent only in women, reflecting their limited use of physical forms of aggression (Campbell, 1999; Archer, 2004). As noted earlier, indirect forms of aggression, such as stigmatization and exclusion, make it problematic to establish whether the aim is to disadvantage a rival or to advantage oneself. Either way, the arena of women’s competition centers chiefly on traits favored by the opposite sex, whereas men’s competition can be more easily split between physical and verbal assaults on rivals, and advertising qualities attractive to women. The question as to whether a distinction is clearer in men warrants attention and future work, adopting a similar analytical approach, might usefully explore this issue.

In respect of the Dark Triad and competition, our findings supported our

current hypotheses, and earlier work (Carter et al., 2014; Jonason et al., 2010). Narcissism, Machiavellianism and psychopathy were correlated with, and significantly predicted, general and sexual competitiveness. Whilst no subscales of sexual competition emerged to allow a more nuanced analysis, exploration of the differential predictive power of the component traits is pertinent since DT is a trio of distinct, though related, constructs. Analyses suggest that narcissism is the strongest predictor of sexual competitiveness as measured by the items in our scale. This may be a reflection of the specific items (or tactics) that loaded onto the emergent factor. Four of the ten items constituting the final scale were drawn from ‘self-promotion’, which might be expected to be predicted most strongly by narcissism, given existing knowledge about narcissists’ attitudes and behaviors (Campbell & Foster, 2002; Campbell et al., 2002). Future work could consider an alternative range of sexually-competitive tactics: tactics defined by manipulation might be better-predicted by Machiavellianism, and tactics which are fundamentally callous by psychopathy.

Our results indicated that narcissism was also the strongest predictor of general competitiveness. Three of the four items that assess narcissism on the Dirty Dozen assess a desire for prestige, status, attention and admiration. Items on the Hypercompetitive Attitude Scale (Ryckman et al., 1990) primarily relate to a dislike of losing (real or self-imagined) or feelings of superiority derived from winning. Since these concepts are inexorably connected to status, attention and (perceived) admiration, this finding sits well with the established literature.

The present findings serve to expand existing knowledge of DT in women. Results support previous findings in this growing field that the desire to compete is higher in DT individuals than in controls, across sexual and non-sexual domains (Jonason et al., 2010). In particular, our results indicate that high-DT individuals are

prepared to engage in greater sexual competition, above and beyond their endorsement of general competition. These findings therefore join a body of research that suggests high-DT individuals have the tools, as well as the inclination, to compete in the sexual marketplace, furthering our understanding of their self-reportedly greater levels of sexual success (Jonason, Li, Webster, & Schmitt, 2009; Jonason et al., 2010).

Like their male counterparts, high-DT women are extremely competitive and are well placed to succeed in securing desirable mates as well as in limiting the success of rivals, thereby increasing their access to higher-quality genetic and well-resourced partners (Gangestad & Simpson, 2000), especially when such men are rare (Fisher, 2004). However, DT tactics will likely lead to friendship and relationship breakdown and abandonment or ostracism in the long-term (Jonason et al., 2010). Nonetheless, since DT individuals are willing and able to abandon existing friendships and relationships to form new ones (especially true of narcissists, Campbell & Foster, 2002; Campbell et al., 2002), this may not constitute a great cost. Longitudinal data would be of great value to exploring the life history trajectories of DT women and men.

We acknowledge limitations with the present study. As in any factor analytic study, it is possible that the failure to find a multi-factorial structure in sexual competitiveness is an artifact of the items that were selected for inclusion in the scale. Further studies using different items might produce different factor structures. We would strongly encourage future studies of mating tactics to employ exploratory and confirmatory factor analysis to assess the empirical status of proposed taxonomies. We also used a youthful student sample, who may display exaggerated levels of competition. Replication with a community sample would be desirable.

In conclusion, our findings of positive associations between Dark Triad traits and sexual competitiveness in women support and expand existing work on the trait constellation in respect of its inherent competitiveness and relation to mating strategies and tactics. In addition, the failure to identify distinctive dimensions of sexually competitive tactics (in terms of intersexual / intrasexual competition or in terms of the four-fold classification of Fisher and Cox (2011)) represents a call to reconsider the terminology employed in this field, and the conceptual constructs which underlie it.

Table 1

Descriptive statistics for all variables

Domain	Sub-scale	Mean	<i>SD</i>
Dark Triad	Narcissism	2.88	.80
	Machiavellianism	2.39	.78
	Psychopathy	1.96	.68
	Composite	2.41	.59
Sexual Competitiveness		2.59	.47
General Competitiveness		2.69	.68

Table 2

Factor analysis of the sexual competitiveness scale

Item	Component 1
It upsets me if my friends are thinner than me (SP).	.44
I take pleasure in pointing out flaws in other women's appearance (CD).	.58
I would tell another woman that her hair looked nice when it didn't (CM).	.24
I wear make-up to increase my attractiveness to men (SP).	.60
I would never spread rumours about other women* (SP).	.24
I would deliberately choose an unflattering outfit for another woman to wear (CM).	.54
When I like a man, I make more of an effort to spend time with his friends (MM).	.34
I sometimes flirt with men to get their attention (SP).	.63
I like to gossip about other women's weight (CD).	.63
I wouldn't be hostile to another woman if she showed interest in my boyfriend* (CM).	.04
If a man I liked were interested in another woman, I would tell him that she was unavailable (MM).	.62
I don't like to tell other women when they've made a mistake* (CD).	.20
If a friend liked the same man as me, I would divert her attention to other men (CM).	.58
If I liked a man, I would compliment him on his appearance (MM).	.38
I wear revealing clothes to attract male attention (SP).	.66
I would be willing to act bisexual to please a man I liked (MM).	.47

Note. Tactical subscale indicated in brackets (SP = Self-Promotion, CD = Competitor Derogation, CM = Competitor Manipulation, MM = Mate Manipulation). Bold indicates items retained on the final scale. * Reverse-keyed items

Table 3

Correlations between the Dark Triad and competitiveness

	1.	2.	3.	4.	5.	6.
1. Dark Triad	-	.77**	.83**	.74**	.71**	.62**
2. Narcissism		-	.45**	.32**	.62**	.52**
3. Machiavellianism			-	.48**	.55**	.49**
4. Psychopathy				-	.50**	.45**
5. General Competition					-	.55**
6. Sexual Competition						-

Note. **Correlation is significant at the 0.01 level (2-tailed)

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Reflection

The Discussion section of this paper highlighted the primary implications of the study: Support for arguments that inter- and intra-sexual competition are not readily distinguishable in women – even when tactics are tied to specific targets (mates and rivals, respectively) - and the importance of factorial analyses beyond internal consistency (Cronbach's) tests in validating scale construction. On this latter point, other methods of statistical assessment that reveal inventories' hierarchical and factorial structures, such as Mokken analysis (Mokken, 1971), may be useful in the evaluation of existing scales (see Chapter 8). It would be intriguing to establish, for example, whether some competitive and sexually-competitive tactics are more readily endorsed than others, across men and women.

In relation to previous assertions (Chapters 2 and 4) regarding a 'shared core' of DT, these results demonstrate that the composite DT scale, as well as each individual DT trait, significantly predicted general and sexual competitiveness. Narcissism was the strongest predictor of both forms of competition, reinforcing the point that some attitudes and behaviours related to DT can be explained by their shared core, where others are better or exclusively explained by individual traits.

Narcissism's emergence as the strongest predictor of sexual and non-sexual competitiveness may be a reflection of how the trait is assessed by the Dirty Dozen measure (Jonason & Webster, 2010). It would be helpful to establish whether this pattern of results is robust across other measures: The SD3 (Paulhus & Jones, 2014), and the established full-length individual DT measures (the NPI (Raskin & Terry, 1988), Mach-IV (Christie & Geis, 1970), and SRP-III (Paulhus, Hemphill, & Hare, 2009). There is some evidence that different aspects of narcissism (overt and covert/hypersensitive narcissism) are differentially related to forms of

competitiveness (Luchner, Houston, Walker, & Houston, 2011). A recent study (using the SD3) found that DT traits are differentially related to specific forms of competitor derogation (Goncalves & Campbell, 2014): narcissism was a predictor of competitiveness and was driven by attempts to ‘outshine’ rivals, Machiavellianism predicted of a rude derogation style, and psychopathy predicted tactics that harmed rivals’ reputations.

Our results suggest a broader point about the role of narcissism as a component of DT. As others have suggested (e.g., Holtzman & Strube, 2013; Rauthmann & Kolar, 2013), narcissism may represent the ‘sexy’ face of DT. Individuals scoring highly for narcissism equip themselves for the pursuit of romantic relationships by self-adornment (Holtzman & Strube, 2013) and by seeking out novel social milieux for exploitation. In the present study, we found that narcissism was also the main driver of sexual competitiveness. Whilst each DT component was a significant predictor of sexual competition, narcissism accounted for more than three times the predictive power of Machiavellianism, and eight times that of psychopathy. This suggests that, of the three DT components, narcissism is the prime candidate for explaining what lies behind high-DT individuals’ apparently higher levels of sexual successes. This interpretation is in keeping with Holtzman and Strube (2010), who posit that narcissism is an adaptive response that solves a series of problems associated with short-term mating³⁶. One of these is narcissists’ ability and willingness to “compete with one’s own gender” (Holtzman & Strube (2010, p. 135). Our findings support this assertion and provide evidence that DT equips women, just as much as men, to engage in a short-term mating strategy, with its various potential benefits (Chapter 5). Insofar as this depends on sexual competition, it seems that

³⁶ Holtzman and Strube focus on narcissism distinctly, however, rather than as one part of DT.

narcissism represents an important 'route',³⁷ to sexual success at least for women.

However, narcissism is not the sole driver of high-DT individuals' mating successes (c.f., Holtzman & Strube, 2013). Machiavellianism and psychopathy also explained a significant amount of sexual competitiveness. In light of Goncalves and Campbell's (2014) findings regarding DT components' association with different forms of competitor derogation, it may be that Machiavellianism and psychopathy are associated with specific tactics of sexual competition - as, indeed, we suggested might be the case in the Introduction section of our paper. Additional work could explore this issue further in relation to an expanded set of sexually-competitive tactics.

In sum, however, the cumulative impression from this and other studies is that DT individuals who score highly for narcissism (more than those who score highly for Machiavellianism and psychopathy) are regarded as sexy, are sexually competitive, and are sexually successful. As suggested earlier, narcissism appears to have fewer negative outcomes and more positive outcomes than Machiavellianism and psychopathy. In particular, it seems to be connected with a number of positive fitness-related outcomes (see Chapter 1). The findings of the present study support this assertion. A later section of this thesis (Chapter 7) will extend the focus on important DT correlates shifts to a key form of evolutionary fitness: health and longevity.

³⁷ To adopt the terminology of Jonason, Lyons, Bethell, & Ross (2013), in reference to DT and empathy.

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Chapter 6

Background

In Chapter 2, one of the questions I expressed a desire to address pertained to ‘where’ the attractiveness of the Dark Triad traits was located: Physicality, personality, and aspects of the individuals considering or rating them have all been raised as possibilities, by me, and by other researchers. Existing evidence suggests that individuals characterized by high levels of the DT traits are adept at personal adornment (Holtzman & Strube, 2013), and that narcissism, in particular, is related to good grooming and dressing in an appealing, ‘flashy’ manner (Vazire, Naumann, Rentfrow, & Gosling, 2008). Past work also indicates that men scoring highly for these traits have a personality which, if not fundamentally attractive, may be more appealing than a personality characterized by an absence of the traits, at least in the short term (Chapter 2; see also Jonason, Lyons, & Blanchard, 2015), although the results from Chapter 3 mean caution is merited in drawing unalloyed conclusions. Research further highlights the role, for female participants, of cycle effects in affected rater perceptions (Aitken, Lyons, & Jonason, 2013; Durante, Griskevicius, Simpson, Cantú, & Li, 2012). Even the weather conditions under which an approach is made have been suggested to be partly relevant (Rauthmann, Kappes, & Lanzinger, 2014). Although this last finding was highly specific (and limited to Machiavellianism), in broader terms, it seems reasonable that environmental context would be pertinent. It is likely that multiple factors play a role in how attractive an individual with high levels of DT is perceived to be. For example, Lyons, Marcinkowska, Helle, and McGrath (2015), reflecting on their results indicating an absence of an innate female preference for ‘dark triad faces’ (i.e., highly masculine faces) consider that men high in DT may alter and enhance their looks in order to

create appeal, or that some women's cycle-related preferences for facial masculinity may alter their perceptions.

Despite the breadth of work exploring a number of potential factors, one potentially fertile area of enquiry has been left relatively undisturbed: How these individuals behave – that is, their specific physical and verbal actions – compared with those with low, or population-average levels of the traits. We have an understanding of how they may *act* across a number of wider-world domains: in education and work, and interpersonally; we can even predict their voting intentions and participation in sports (Arvan, 2013; Furnham, Richards, & Paulhus, 2013; Nathanson, Paulhus, & Williams, 2006; O'Boyle, Forsyth, Banks, & McDaniel, 2012; Strout & Carter, 2015; Williams, McAndrew, Learn, & Harms, 2001). We also have an insight into how they conduct themselves within relationships (e.g., Jonason, Li, & Buss, 2010; Jonason & Kavanagh, 2010). However, much of this work has depended upon extrapolation from responses to assorted inventories, with little undertaken in the way of behavioural work.

In particular, there is a lack of knowledge as to whether individuals with high levels of DT exhibit behaviours in dating-type scenarios that are quantifiably more endearing, charming, or 'smoother' than others. If so, this would go some way to explaining why and when they may be perceived as attractive, and (for men) their self-reportedly high levels of mating success. It would additionally serve as an indicator as to the means by which they create a positive impression on others that has been reported at early, and limited exposure (Paulhus, 1998).

In respect of anticipating sex differences, previous work (Chapters 3 and 5) has indicated that women with high levels of DT are no less interested in, or equipped to compete for, mating opportunities. Although they have higher standards than men

for short-term mates (Jonason, Valentine, Li, & Harbeson, 2011) in the scenario used in this study - creation of a video for a dating website profile – one cannot control, or be certain of the potential mates by which one is seen (and evaluated). We expect that men will optimise their performance in seeking to maximise their appeal to the largest number of potential mates possible (Schmitt et al., 2004). We expect women to do so too, but in order to create the greatest potential of attracting a mate (mates) with high levels of physical attractiveness and a good genetic quality (Schmitt, 2014), with whom they are more likely to pursue a sexual relationship (Guéguen, 2011). Whilst we therefore anticipate both male and female participants will ‘sell’ themselves to the best of their abilities, we remain agnostic as to the possibility that differences will emerge in how they do this. Multiple aspects of speech patterns, for example, have been shown to differ significantly between the sexes (e.g., Turner, Dindia, & Pearson, 1995). In order to maximise our ability to explore this issue, however, we will not code for behaviours that are manifestly unique to either sex (such as women’s breast presentation/cleavage-showing; Vazire et al., 2008).

Ultimately, this study was designed to measure the suite of behaviours individuals high in DT exhibit by which they are able mask their disagreeable, self-centred nature and create an endearing veneer during a first impression. No existing work (to my knowledge) had previously assessed all three traits’ contributions to behavioural patterns in the context of a dating scenario of this nature. The study presented over the following pages offers a formative attempt at redressing this, by recruiting male and female participants from across the spectrum of DT, and setting them in a context whereby they are motivated to appear as attractive as possible to potential opposite-sex partners.

The study is presented below in the form in which it is currently under review.

Following the paper is a reflection that considers the findings in the context of subsequent research and discussion.

Less-than-candid camera: A preliminary study of the verbal and nonverbal behaviors
of Dark Triad individuals in dating-profile videos³⁸

Abstract

Previous work has noted the impression-management abilities and self-reported sexual success of individuals scoring highly for the Dark Triad (DT) traits of narcissism, Machiavellianism, and sub-clinical psychopathy. However, little work has explored how these individuals actually behave within dating-type scenarios. We conducted a small-scale ($N = 30$) exploratory study of the verbal and nonverbal behavioral patterns of these individuals in a two-minute video filmed for a fictitious dating website. Each DT trait significantly predicted a number of attractive interpersonal behaviors. In particular, all were related to gaze duration at the intended target (via our camera). In addition, DT traits were associated with verbal behaviors in respect of speech *style* (a less frequent use of filler words; a greater length of time spent speaking) but not with speech *content* (the use of positive phrases, references to socialization, or references to desirable personal attributes). None of the associations revealed were moderated by sex. Results are discussed in relation to DT impression management and mating strategies.

³⁸ Carter, G. L. (2015). *Less-than-candid camera: A preliminary study of the verbal and nonverbal behaviors of Dark Triad individuals in dating-profile videos*. Manuscript under review.

1. Introduction

Research on the Dark Triad of personality (DT: Narcissism, Machiavellianism, sub-clinical psychopathy) has indicated that individuals scoring highly for these traits often generate positive initial impressions (Dufner, Rauthmann, Czarna, & Denissen, 2013; Holtzman & Strube, 2013; Paulhus, 1998; but see Rauthmann & Kolar, 2013). This is in spite of their typically possessing aversive interpersonal attitudes and demonstrating negative behaviors, including competitiveness, deceitfulness, and a tendency towards anti-social behaviors (Baughman, Jonason, Lyons, & Vernon, 2014; Carter, Campbell, & Muncer, 2014b; Jonason, Li, & Teicher, 2010). Moreover, they are egocentric, agentic, and poorly suited to long-term friendships or relationships (Lyons & Aitken, 2010; Jones & Paulhus, 2010; Jonason, Li, Webster, & Schmitt, 2009). At first impression, however, individuals with high levels of DT traits may seem charming and engaging, even appearing more attractive than controls (Carter, Campbell, & Muncer, 2014a; Holtzman & Strube, 2010; Wilson, Near, & Miller, 1998). This positive impression has been shown across a range of early-stage interpersonal exchanges (Curry, Chesters, & Viding, 2011; Holtzman, 2011; McHoskey, 2001).

One area that has received much empirical attention in relation to DT traits is mating. Men high in DT traits report substantial short-term mating success (Holtzman & Strube, 2013; Jonason, Koenig, & Tost, 2010; Visser, Pozzebon, Bogaert & Ashton, 2010), and women high in DT traits are extremely sexually competitive (Carter, Montanaro, Linney, & Campbell, 2015). However, we have limited knowledge as to how DT individuals actually behave in a dating context; in particular, how they succeed in creating a positive first impression for potential partners, and how they differ from others in this respect. The present study seeks to examine this by

analyzing the verbal and nonverbal behaviors of individuals with varying levels of DT traits in the context of a short video created for a dating site.

The Dark Triad

Although they may aid an individual in creating an attractive early impression, the Dark Triad traits of sub-clinical narcissism (a self-absorbed love for oneself), Machiavellianism (an exploitative, calculating approach to others), and psychopathy (an impulsive and callous lifestyle orientation) share a self-centered, manipulative, and cold core, low in Agreeableness and Honesty-Humility (Lee & Ashton, 2005). Several attitudinal and behavioral correlates of DT have been established: Competitiveness, impulsivity, and sensation-seeking (Carter et al., 2014b; Jonason et al., 2010), high sociosexual orientation (Jonason & Webster, 2010), a cavalier attitude towards extra-pair mating (Adams, Luevano, & Jonason, 2014), and an inclination to seek and acquire new sexual partners, abandoning existing relationships to do so (Jonason, Li, & Buss, 2010). Thus, whilst they may create an appealing veneer, these individuals do not represent viable long-term partners.

Little is known about how individuals with high levels of DT succeed in creating an initially attractive façade. Existing knowledge is largely confined to the study of narcissists, with their appeal ascribed to their clothing style, self-assured body movements, verbal humor and charming facial expressions (Back, Schmukle, & Egloff, 2010). Research has also indicated narcissists frequently talk about friends and engage in group activities (Holtzman, Vazire, & Mehl, 2010). Others have attributed narcissists' initial popularity to their assertiveness (Küfner, Nestler, & Back, 2013). In respect of Machiavellianism and psychopathy, very limited knowledge exists regarding behaviors that might explain their attractiveness beyond broad concepts associated with these traits, such as highly-Machiavellian individuals' proclivity for

verbal manipulation and their assertive interpersonal manner (Johnson & McCroskey, 2010). Psychopathy has also been related to effective personal adornment (i.e., clothing; make-up) in creating a superficially attractive physical impression (Holtzman & Strube, 2013). The study of interpersonal traits is otherwise largely confined to work with clinical populations (Fowler, Lilienfeld, & Patrick, 2009; Rimé, Bouvy, Leborgne, & Rouillon, 1978; Smith, Watts & Lilienfeld, 2014).

It can be inferred from existing knowledge that the negative traits associated with DT are likely to be suppressed at initial exposure (Paulhus, 1998; Küfner, et al.). Lying, cheating, and emotional manipulation are all associated with DT; all are also associated with relationship breakdown. Therefore, to achieve success in the sexual market place, we expect individuals with high levels of the DT traits to present a positive and appealing front at first exposure. Verbal and nonverbal behaviors form a crucial part of courtship rituals in cultures across the world (Eibl-Eibesfeldt, 1989). We expect high DT scorers to exhibit behaviors that emphasize (accurately or otherwise) their best attributes, suppressing their “darker” ones, especially in the context of a dating-website video, where the intention (if interest is to be piqued and benefits derived) is to appear in the most positive light. Past studies of the mating-related attractiveness of high Dark Triad individuals have employed written character descriptions (Carter et al., 2014a; Rauthmann & Kolar, 2013). What DT men and women with high levels of DT actually say and do to foster a positive impression remains comparatively unknown. The current study therefore employed a situation in which participants would be motivated to “sell” themselves to the opposite sex and so enable us to examine the association between DT traits and the verbal and nonverbal behaviors used to attract mates. Behavioral relationships that emerge may, at least partially, explain the interpersonal appeal and reported sexual success of individuals

high in DT.

We also wanted to explore whether specific relationships would be found between individual DT traits and particular behaviors: Focus on a single composite DT trait does not allow examination of the subcomponents which may have unique as well as common effects on the outcome measures (Furnham, Richards, & Paulhus, 2013). Finally, as previous research has considered the similarities and differences between men and women scoring highly for the DT traits (e.g., Carter et al., 2014b; Jonason, Lyons, Bethel, & Ross, 2013), we will establish whether any associations found differ according to sex.

For the present research, we recruited an initial pool of respondents from which we selected individuals to represent a range of scores on the DT traits. These individuals were then filmed in a 2-minute self-introduction video as if for a dating website profile. The choice of behaviors to be coded was informed by Back et al. (2010) and Holtzman et al. (2010), as well as the wider DT literature. We hypothesized that the *nonverbal* behaviors of participants with high levels of DT traits will advertise a more confident, engaged, and desirable personae compared with participants with low levels of the DT traits. Specifically, they will: i) sustain longer direct gaze towards the camera; ii) smile more frequently; iii) appear more physically at-ease; iv) gesticulate more smoothly; and v) adopt a more relaxed and open posture (uncrossed legs; arms). We also hypothesized that high DT participants' *verbal* behaviors will project a self-assured, 'charming' personae, and compared with controls. Specifically, they will: vi) use more positive verbal statements; vii) make more frequent reference to engagement in social contexts; viii) emphasize a greater number of desirable personal attributes; ix) speak with greater clarity (less frequently use 'filler' words e.g., "um"; "err"); and x) speak for a longer during the filming

period (i.e., pause less often).

2. Method

2.1 Participants. As a filter for the video study, two hundred and forty-two individuals (107 women; 135 men), aged 18-34 ($M_{\text{Age}} = 19.56$, $SD = 2.20$) were recruited to complete a 12-item measure assessing narcissism, Machiavellianism, and psychopathy (Dirty Dozen: Jonason & Webster, 2010). All participants were given course credit for their time, and offered the opportunity to participate in a follow-up study for additional credit. Of the original participants, 137 indicated interest in the follow-up study.

In order to ensure a full range of scores on DT from this pool, composite scores were inspected. As previous research has reported sex differences in DT traits (e.g., Jonason et al., 2009), means were established for each sex (Women: $M = 2.36$, $SD = .47$; Men: $M = 2.63$, $SD = .57$). The five lowest and highest scorers for each sex were selected. All scored at least one standard deviation below or above the mean. ANOVAs confirmed that for each of the DT traits, mean scores were significantly lower in the “low” sample than in the “high” sample (all p -values $< .05$), such that individuals in the high group were significantly higher in all three components of DT. To ensure coverage of the mid-range of DT, five participants whose scores fell closest to the DT mean for their sex were selected. Table 1 presents descriptive statistics for the male and female samples. A comparison of trait scores between men and women showed a significant difference only in psychopathy scores ($t(28,1) = -2.10$, $p < .05$), with women scoring lower than men.

2.2. Procedure. Selected participants were individually invited to a filming session. They were briefed that they would be asked to answer a “non-intrusive, straightforward question” about themselves on camera. Upon arrival, participants

were shown to a private room with plain walls and an adjustable chair positioned opposite a video camera. Participants were then briefed to imagine that they were filming a two-minute personal video for a dating website, responding to the question “How would you describe yourself?”. The experimenter explained that they would turn the camera on and then exit the room, allowing participants to answer in private. A knock on the door would indicate that the two minutes had elapsed, and that the speaker should conclude. The experimenter would then re-enter, de-brief participants, and thank them for their time.

2.3. Measures.

2.3.1. *The Dirty Dozen*. Jonason and Webster’s (2010) Dirty Dozen is a brief, 12-item measure of DT which assesses narcissism, Machiavellianism and psychopathy with four items each. Participants respond on a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*) to items, including: “I tend to want others to admire me” (narcissism), “I have used deceit or lied to get my way” (Machiavellianism), and “I tend to lack remorse” (psychopathy). In spite of its concise nature, it has proven reliable across multiple studies, and had acceptable to good full scale and subscale consistency in the filter study (DT $\alpha = .72$; narcissism, $\alpha = .62$; Machiavellianism, $\alpha = .82$; psychopathy, $\alpha = .75$).

2.3.2 *Coding*. Two independent raters blind-coded participant videos (see Appendix). Correlation agreement is given in brackets. Where raters differed in their coding, the filmed material was reviewed and scores were revised by agreement. Three qualitative variables were coded using three-point Likert scales: Physical ease (“comfort”, $r = .82$), smoothness of gesticulation (“gesticulation” $r = .79$), and openness of posture (“posture”, $r = .81$). Seven variables were unit coded in terms of frequency or duration: Gaze was recorded as the length of time (in seconds) the sitter

looked directly at the camera ($r = .85$). Smiles were coded as the total number of smiles produced by the sitter ($r = .79$). The number of positive verbal statements (“positivity”, $r = .81$), references to social contexts (“sociability”, $r = .85$), and references to desirable personal attributes (“desirability”, $r = .85$), were each counted and recorded. “Clarity” was reverse-scored as the number of filler words used ($r = .86$). “Speech length” was the length of time (in seconds) that the participant spoke of the available 120 seconds, discounting time occupied by filler words ($r = .88$).

3. Results

Table 2 presents means and standard deviations for all coded variables. Tests for sex differences showed men and women differed in the use of positive words, $t(28) = -3.09, p < .01$, with men using more positive words, and in speech length, $t(28) = -2.41, p < .01$, with men speaking for longer.

In order to examine relationships between DT traits and specific behaviors, we regressed composite DT, narcissism, Machiavellianism, and psychopathy onto each of the coded behaviors for the full sample (Table 3). Machiavellianism was a significant predictor of almost all nonverbal behaviors (marginally non-significant in respect of smile frequency, at $p = .053$). Machiavellianism, and by extension, composite DT, were the only predictors of any verbal behaviors; specifically, of filler word use and length of speech. Narcissism also predicted physical comfort, and psychopathy predicted smile frequency. All three traits predicted gaze duration. Moderation analyses confirmed that none of these associations differed as a function of sex ($p > .05$).

Overall, our data indicated that several coded behaviors were associated with different levels, and different component traits, of the Dark Triad. Irrespective of sex, narcissism predicted physical comfort, and psychopathy predicted frequency of

smiling. Each, along with Machiavellianism, predicted gaze duration. Amongst the DT component traits, Machiavellianism was the strongest predictor of nonverbal and sole predictor of verbal behaviors.

4. Discussion

Predicted relationships consistently emerged in the direction we hypothesized. All nonverbal behaviors showed significant relationships with one or more DT traits. The same was true of verbal style (duration; filler word use), but not of verbal content. Amongst behaviors that we found to be related to one or more DT traits, moderation analyses invariably showed sex to be irrelevant. Thus, men and women scoring highly for the DT traits behaved in very similar ways in the mate-attraction, impression-management scenario we created, presenting themselves as confident, articulate, and engaged potential partners.

The most consistent nonverbal association was for gaze duration, which was related to each of the DT traits. Highly-narcissistic, Machiavellian, and psychopathic individuals, regardless of sex, engage in sustained eye-contact with prospective romantic targets. Although the effects of direct gaze have been proposed to depend on contextual cues (Ellsworth & Langer, 1976), our setting represented a context in which credibility, trustworthiness and attractiveness were highly pertinent. Sustained direct gaze has been found to increase raters' impressions of all these (Bayliss & Tipper, 2006; Burgoon, Manusov, Mineo, & Hale, 1985; Scherwitz & Helmreich, 1973). Direct gaze may therefore represent an effective behavioral tactic in early-exposure social and romantic scenarios through which individuals high in DT traits are able (in contexts where it is to their advantage) create a favorable impression. Smiling, which showed significant associations with psychopathy and composite DT,

has similarly been associated with increased ratings of attractiveness and intelligence, and it generates “warm” feelings in the viewer (Lau, 1982).

Postural openness was associated with Machiavellianism and composite DT score. A relaxed and open posture suggests intimacy, composure, and a cooperative demeanor (Burgoon, 1991; Burgoon, Guerrero, & Manusov, 2002) and, at least in women, affects attractiveness judgments (Osborn, 2006). Gesticulation smoothness was significantly predicted only by Machiavellianism (the relationship with the composite was marginal), and has similarly been linked to favorable impression creation (Riggio & Friedman, 1986; Burgoon et al., 2002). Physical comfort, predicted by narcissism, Machiavellianism, and composite DT, is regarded as attractive and endearing in initial impressions as a component of physical “self-assuredness” (Back et al., 2009).

In the verbal domain, longer speech duration was correlated with Machiavellianism and with DT composite score, and may also foster impressions of intelligence: Longer utterances are associated with higher levels of education (Sillars, Shellen, McIntosh, & Pomegranate, 1997). Additionally, the use of fewer filler words, associated with Machiavellianism and with DT composite may indicate greater social confidence and shape perceptions of the speaker. Von Tiling (2011) found that hesitant speech (incomplete phrases, revisions, and interjections) affected listeners’ perceptions such that hesitant speakers were regarded as less pleasant, self-confident, and communicatively competent than others. Thus, the conventional view of highly-Machiavellian individuals as smooth, yet deceptive, talkers appears to be supported (Paulhus & Williams, 2002; Geis & Moon, 1981).

Overall, the relationships that we report between DT and verbal and nonverbal behaviors provide a partial explanation for the positive impressions created by both

men and women with high levels of the DT traits. That fact that Machiavellianism, in particular, was related to such a large number of behaviors (posture, gesticulation, comfort, gaze duration, use of fewer filler words, and speech length) is likely an indication of Machiavellians' behavioral flexibility and sensitivity to the effect of social cues, which has been argued to be of considerable advantage in interpersonal interactions (Jones & Paulhus, 2009; Cziror & Bereczkei, 2012). The present findings also align with existing work linking narcissism to self-assured bodily movements (Back et al., 2010), although it was not related to participants verbally "selling" themselves by emphasising their sociability, as reported by Holtzman et al. (2010). However, this discrepancy may arise from the fact that Holtzman et al. monitored behaviour in day-to-day life, rather than in the specific context of a dating video directed at the opposite sex. The relationship between sub-clinical psychopathy and smiling and direct gaze, represent a novel set of findings, but the trait's relation to a broad range of impression-management behaviours that mask the darker aspects of that personality endorses the psychopathic short-termist, deceptive, and exploitative "cheater" strategy proposed by others (Book & Quinsey, 2004; see also Jones & Paulhus, 2010).

There was no effect of moderation by sex in any trait-behavior relationships. Although sex differences were absent in the present sample, it is possible that men and women scoring high for DT traits may employ additional behavioral strategies that were not measured in the current study. For example, women characterized by high levels of DT traits might employ (female) sex-typical behaviors as part of their impression-creation for potential partners, such as hair-touching or cleavage displays (Moore, 2010). We also did not code for laughter, a verbal behavior that, if accompanied by other signals, can indicate female sexual interest (Grammer, 1990).

Other verbal behaviors (e.g., the use of justifiers and intensifiers) have also been shown to differ between men and women (Turner, Dindia, & Pearson, 1995), and might affect impression creation.

The primary limitation of the present work is sample size. A small sample gives rise to possibility that an individual participant may have a disproportionate effect on results. However, no other studies, to our knowledge, have used an observational methodology of this kind in the study of all three DT traits. Given that this is an emerging area of research, we feel our sample size is justifiable as an exploratory study. Additional behaviors, gendered behaviors, and a larger number of participants might all be encompassed within future studies.

In conclusion, we found that the Dark Triad traits, in men and women, are related to multiple verbal and nonverbal behaviors that are known to create positive impressions in a scenario where the purpose is to attract potential partners. These behaviors may contribute to the social and sexual successes that individuals self-report, and are reported to achieve, especially in early and limited-exposure relationships. In both sexes, high levels of composite DT are particularly related to a majority of nonverbal behaviors (sustained gaze, more smiling, greater comfort, and postural relaxation), as well as longer speech length and the use of fewer filler words. These are indicative of a general DT-related verbal and nonverbal confidence and competence. We hope that future work continues to explore the issue of interpersonal behaviors associated with DT. Comparable methodologies, used by studies that consider a wider range of behaviors across both romantic and social contexts would aid our understanding of how these individuals actually behave.

Table 1

Descriptive statistics for DT traits (Dirty Dozen) for filmed sample

	Male <i>M</i> (<i>SD</i>)	Female <i>M</i> (<i>SD</i>)	<i>d</i>
Narcissism	3.13(.75)	3.03(.71)	.14
Machiavellianism	2.48(1.09)	2.45(.68)	.03
Psychopathy*	2.48(.98)	1.85(.63)	.61
DT composite	2.70(.73)	2.44(.57)	.40

Note. * $p < .05$

Table 2

Descriptive statistics for all coded variables

Behavior	Male <i>M</i> (<i>SD</i>)	Female <i>M</i> (<i>SD</i>)	<i>d</i>
Positivity**	13.13 (3.07)	9.53 (3.31)	1.13
Sociability	3.60 (2.13)	3.40 (1.99)	.10
Desirability	10.40 (1.99)	9.07 (3.41)	.50
Filler word use	26.33 (9.09)	20.47 (10.27)	.60
Speech length*	94.07 (10.59)	80.33 (19.33)	.88
Gaze duration	58.13 (14.03)	52.20 (24.69)	.38
Smiles	6.13 (2.36)	5.93 (2.66)	.08
Comfort	1.73 (.70)	1.80 (.77)	.10
Posture	1.73 (.88)	2.00 (.76)	.33
Gesticulation	1.60 (.63)	1.73 (.80)	.18

Note. * $p < .05$, ** $p < .01$

Table 3

Regression of DT traits on all behaviors

Behavior	Narcissism			Machiavellianism			Psychopathy			DT Composite		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Positivity	1.12	.93	.22	1.15	.74	.28	1.37	.74	.33	1.95	.98	.35
Sociability	.64	.52	.23	.76	.41	.33	.59	.43	.25	1.07	.55	.35
Desirability	.72	.73	.18	.94	.57	.29	.85	.59	.26	1.36	.77	.32
Filler word use	-2.87	2.58	-.21	-5.18	1.88	-.46**	-2.52	2.11	-.22	-5.79	2.66	-.38*
Speech length	5.31	4.32	.23	7.86	3.25	.42*	6.83	3.41	.35	10.94	4.38	.43*
Gaze duration	14.18	4.49	.51**	8.53	3.89	.38*	9.64	3.89	.42*	16.54	4.78	.55**
Smiles	1.15	.61	.33	.99	.49	.36	1.32	.47	.47*	1.84	.62	.49**
Comfort	.48	.17	.47**	.33	.14	.40*	.08	.16	.09	.43	.19	.39*
Posture	.29	.21	.25	.51	.15	.55**	.22	.17	.24	.56	.21	.45*
Gesticulation	.29	.18	.29	.37	.13	.46*	.06	.15	.08	.38	.19	.35

Note. * $p < .05$ ** $p < .01$

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Appendix

Operational definitions used to code verbal and nonverbal behaviors

Verbal behaviors:

Positivity: Number of positive verbal expressions (e.g., “yes”, “good”, “great”, “like”, “happy”) used as descriptors (note context).

Sociability: Number of references to social engagement (e.g., friends, family, teams)

Desirability: Number of desirable attributes ascribed to self: Education; cultural interest; Extraversion; Conscientiousness, physical activity, Openness, leadership roles, spontaneity (note context).

Filler word use: Number of filler utterances (e.g., “umm”, “err”).

Speech length: Time spent speaking (seconds); excluding filler utterances.

Nonverbal behaviors:

Gaze duration: Time (seconds) looking directly into the camera lens.

Smiles: Number of smiles: lips curved upwards (visibility of teeth irrelevant).

Comfort: Raters’ scale, 1-3, “nervous-relaxed physicality”: 1 = Fidgety (swinging legs; swivelling; fidgeting with hands), 2 = Inconsistent/non-distinct, 3 = Confident posture (upright; stable; no/little fidgeting).

Posture: Raters’ scale, 1-3, “tight-open posture”: 1 = Defensive (arms crossed; hands clasped between legs), 2 = Inconsistent/non-distinct, 3 = Relaxed (arms/legs uncrossed/unshielded; shoulders back).

Gesticulation: Raters’ scale, 1-3, “smooth-awkward gesturing”: 1 = Not smooth (non-existent or staccato/functional gestures; 2 = Inconsistent/non-distinct; 3 = Smooth (freely-motioning hands or illustrative gestures).

Reflection

The present study was successful in its attempt to identify a number of verbal and nonverbal behaviours predicted by the DT traits that are associated with the creation of a positive and attractive impression in others. As noted in the discussion section, its primary limitation was a practical one: With restricted resources, I was only able to assess a comparatively small number of participants across a limited number of behaviours. I hope that, if published, this study will pique interest in the subject matter, however, and may provide impetus for future work that will expand upon these initial findings and extend them to increasingly more realistic scenarios. Speed-dating, for example, has previously been proposed (Chapter 1) as one milieu in which we could expect behavioural differences in high- and low-scorers for DT to manifest. Existing work on dominance and boldness, both associated with DT (Jonason & McCain, 2012; Hodson, Hogg, & MacInnis, 2009; Lilienfeld et al., 2012; Paulhus & Williams, 2002), and with success in mating broadly (Gangestad & Simpson, 2000) and in speed-dating scenarios (Asendorpf, Penke, & Back, 2011) suggests that individuals with high levels of the DT traits would be well suited to this. A paradigm involving a mix of individuals with a range of narcissism, Machiavellianism, and psychopathy levels would provide opportunities to assess a number of issues. Given their focus on pursuing mating opportunities, assessing whether reciprocity in terms of mate choice and accuracy in perceptions of sexual interest are related to DT would be intriguing (see also Back et al., 2011; Perilloux, Easton, & Buss, 2012). A methodology of this kind would also represent opportunity to explore, beyond the laboratory (per Chapter 3; Jonason et al., 2015) the extent to which high- and low-scorers for DT identify, and express a preference for, individuals

of a comparable or opposing personality type in respect of DT (i.e., testing for evidence of assortative mating).

Other routes of enquiry also emerge from the present study. As noted above, previous work has typically depended upon the creation of vignettes or characters, or else the use of actors in exploring the attractiveness of DT. The videos created by participants in the present study could be utilized in the exploration of a number of aspects of a DT personality and its attractiveness. Most straightforwardly, the videos themselves could be rated by opposite-sex participants for to their attractiveness in respect of a number of relationship types (e.g., one-night stands, booty calls, long-term relationships, marriage, co-parenting). Alternatively, to eliminate the role of physicality and instead solely assess the DT personality, participants could rate transcripts of the video responses. Such a study would provide valuable data that would avoid the artificial nature of previous character/vignette studies (including issues raised in Chapters 2 and 3). Alternatively, participants could rate the audio track of the videos from the present study. This could either take the form of an unadulterated record of oral responses given in the present study, or otherwise obscure the words, but test whether the intonation of individuals across the DT spectrum differs, and whether this is in any way related to attractiveness or the formation of a positive impression. Finally, participants could rate a muted version of the videos; this would require a methodology that would allow for the separation of the effects of physical attractiveness and nonverbal behaviours, but could yield informative data. Any such study would take advantage of one of the primary strengths of this paper – these are not artificially-created characters; they are real individuals with varying degrees of the Dark Triad traits.

Indeed, those participants characterized by high levels of the traits reported high levels of *all* DT traits. This adds support to the argument proposed in the reflection section of Chapter 1, and for our character creation, and further counters the assertion of Furnham, Richard, Rangel, and Jones (2014) regarding the “theoretical impossibility” of an individual being “all three” of the DT (p. 119). Moreover, the shortcomings of previous work where the DT traits were only assessed individually (or else one or more were not studied at all) were avoided: In this study, it was possible to test for relationships between all three traits and outcomes, whilst accounting for their shared variance, providing a theoretically-sound overall picture of how the DT traits individually, and collectively, relate to a range of specific verbal and nonverbal behaviours.

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Chapter 7

Background

The material presented in this chapter is a collaboration that arose out of my interest in assessing health-related correlates of the Dark Triad (DT), against a wider theoretical backdrop of DT-fitness-related outcomes. This interest converged with the research interests of Peter Jonason, University of Western Sydney, Holly Baughman, University of Western Ontario, and Phillip Parker, Amsterdam Catholic University. The study reported in this chapter formed one part of a four-part project. The present chapter is a report of the data collected and analysed by myself (Study 3 of a published paper). This background section will function as an Introduction to the overall project, and to my study. The method, results and analyses that formed my contribution to the project are presented following this section. They are reproduced here in a slightly modified version to how they feature in the published paper so as to function as a stand-alone study (e.g., table numbering; contents have been modified to reflect only my data).

The purpose of the present study was to establish the health-related costs - or, indeed, benefits - of DT. This was in light of a suggestion (Friedman & Kern, 2014) that the relationship between personality and health should receive attention in respect of short- and long-term outcomes. For Friedman and Kern, “longevity is, for most purposes, the single best measure of health” (p. 721); these authors additionally suggested that subjective well-being, social competence, productivity, and cognitive functioning (as both important indicators of physical health themselves, and frequent, often strong correlates of longevity) be considered. As a group of collaborators, we therefore resolved to measure these factors relative to DT, which has thus far received limited attention in respect of these important fitness-related outcomes. The primary

focus of the study was overall longevity, in addition to health-averse behaviours and life history (or ‘tempo’).

Individuals with high levels of the DT traits are considered to live a ‘fast’ life (Crysel, Crosier, & Webster, 2013), expending energy on the pursuit of an opportunistic and exploitative short-term mating strategy (Jonason, Li, Webster, & Schmitt, 2009; Jonason, Luévano, & Adams, 2012) at the expense of high levels of parental investment and, we suggest, personal longevity. This ‘fast’ life is typically defined by traits that include future-discounting (Jonason, Koenig, & Tost, 2010), aggression (Jonason & Webster, 2010; Pailing, Boon, & Egan, 2014), competitiveness (Chapter 4; Chapter 5), and restricted empathy (Jonason & Krause, 2013; Jonason, Lyons, Bethell, & Ross, 2013), compounding the likelihood that their longevity (as per Friedman & Kern, 2014) might be limited. These affiliated traits, taken together, also go some way to explaining why the DT traits have, by some authors, been considered maladaptive (e.g., Kowalski, 2001).

However, others have reflected on the potential advantages for seemingly negative personality traits, (e.g., Nettle, 2007; major costs and benefits of DT are also outlined in Chapter 1 of this thesis), and concluded that sub-clinical personality traits can seldom, if ever, be considered purely maladaptive (see also Paulhus & Williams, 2002). As proposed in Chapter 1, and revisited throughout this thesis, one perspective on DT posits psychopathy as the ‘darkest’, or most costly of the three traits, with Machiavellianism (to extend the conceptualization of Rauthmann, 2012) occupying something of a ‘grey’ in-between area, and narcissism the ‘lightest’, or most beneficial trait (relatively; each component of the Triad has its own costs and benefits).

In both sexes, psychopathy is the strongest correlate of dysfunctional

impulsivity (e.g., Jones & Paulhus, 2011), which is characterised by limited foresight and a tendency to ignore facts when making decisions (Dickman, 1990).

Dysfunctional impulsivity has additionally been connected (again, in men and women) with an increased risk of substance abuse (Adan, 2012; Pitts & Leventhal, 2012). Indeed, psychopathy has been linked to extremely poor decision-making in respect of many cost/benefit scenarios (e.g., Jones, 2014; Van Honk, Hermans, Putman, Montague, & Schutter, 2002). It is therefore unsurprising that psychopathy, among DT traits, has been suggested to be the primary driver of a ‘fast’ life:

Psychopathy essentially seems to reflect an “it will never happen to me” attitude. Such an attitude manifests in a preferential focus on immediate satisfaction over long-term outcomes, which ignores evidence that certain behaviours - including smoking, drinking, and engaging in risky sexual practices - pose grave risks to an individual’s health. These activities can cause a number of life-shortening diseases (e.g., cancers; cardiac issues; strokes; STDs).

Some evidence already exists to support a relationship between DT and specific health-related behaviours; in an earlier work. Jonason, Koenig, and Tost (2010) found psychopathy to be a predictor of illegal drug use, quantity of cigarettes smoked, and alcohol consumption. In the present study, our prediction was therefore that major health-averse behaviours would be correlated with and predicted by psychopathy; the trait was also expected to predict a ‘fast’ life tempo and truncated longevity.

How Machiavellianism may relate to health behaviours, life tempo and longevity is less clear. Machiavellianism has repeatedly been more closely aligned with psychopathy than narcissism, to the extent that the two have together been referred to as representing a ‘dark dyad’ in their shared negative relationship with

several adverse outcomes. This includes subjective well-being (Egan, Chan, & Shorter, 2014). That said, high-Machs are often described as shrewd and impassive, and the relationship between Machiavellianism and impulsivity is far from clear (e.g., Jones & Paulhus, 2011). However, other research suggests that high-Machs have limited self-control (Jonason & Tost, 2010). Similarly, while some research has suggested Machiavellianism forms part of a ‘fast’ approach to life (McDonald, Donnelan, & Navarette, 2012) the trait has elsewhere failed to map convincingly onto indicators of a ‘fast’ strategy (Jonason et al., 2010). Lastly, although Machiavellianism has been found to correlate with alcohol consumption, it does not appear to be a predictor of such behaviour, and was not related to other unhealthy behaviours (Jonason et al., 2010). In sum, conclusive evidence suggesting that Machiavellianism should be related to negative health behaviours, life tempo, or longevity is limited. We therefore did not specifically predict this trait would be related to any outcomes in the present study, remaining open to the possibility of significant results.

Narcissism is a stronger predictor of functional impulsivity (enthusiasm; quick decision-making), than dysfunctional impulsivity, and is not associated with many of the deleterious behaviours described above. Jonason et al. (2010) reported a correlation between narcissism and alcohol consumption; however, the trait did not emerge as a predictor of drinking habits (similar to Machiavellianism). In respect of the evidence currently available, it seems less likely that narcissism would be related with adverse health-related behaviours. Additionally, in respect of life tempo and lifespan, another correlate of narcissism warrants discussion. In the context of a broad approach to longevity (Friedman & Kern, 2014), it is pertinent to consider the extraverted, socially-engaged style which typifies narcissism, and facilitates the

formation of new friendships (Jonason & Schmitt, 2012) as well as romantic relationships (Foster, Shrira, & Campbell, 2006). Regardless of the self-serving reasons as to why narcissistic individuals might value these connections (e.g., ego validation; being the focus of attention; increased mating opportunities), a wealth of evidence has noted the benefits of social support to health (Cohen, 2004; Cohen & Wills, 1985; House, Landis, & Umberson, 1988). Narcissism, moreover, has been found to mediate the feelings of loneliness that typically increase with age (Carter, 2010). Loneliness has a particularly deleterious effect on both psychological and, subsequently, physical health, often inducing depression (e.g., Routasalo, Savikko, Tilvis, Strandberg, & Pitkala, 2006), which can substantially hasten the end of life, naturally, or even at one's own hand (Battergay & Mulleijans, 1992). Resultantly, in this study, our prediction was that narcissism would be positively related to longevity and life tempo.

Ultimately then, the expectation for the current study was that different relationships would emerge between psychopathy and narcissism in respect of health-related behaviours, life history, and life expectancy. We expected the former would be related to negative health behaviours, a 'fast' tempo and short life expectancy, whilst narcissism would be unrelated to adverse health behaviours, and positively correlated with both life tempo and expectancy. In this way, narcissism would represent something of a 'protective' trait, compared with psychopathy, and the two would manifest opposing sides of a 'trade off' against one another within DT.

To explore these predictions, specific measures were required. First, the Living-to-100 Calculator (LTCC) was chosen to assess participants' health-related behaviours. The full calculator consists of 53 items. However, as the focus of this study was participants' own behaviours, a number of items were candidates for

removal: seven were demographic (sex, age, marital status, education level, local environment; work days/hours), and five pertained to family health (parents'/grandparents' longevity; history of disease). Five further items referred to blood pressure and cholesterol levels. These were removed. Of the remaining 36 items, six were binary, and are not necessarily related to individuals' own behaviours (heart attack history, lung disease history, regular bowel movements, diabetes, requiring supplemental calcium; supplemental iron), with an additional one ("do you smoke?") subsumed under another question ("how often do you smoke?", to which "I do not smoke" was an option). Five items pertaining to flossing, and caffeine, carbohydrate and aspirin intake were omitted, as the health costs and/or benefits of these are debated. The remaining items pertained to specific, quantifiable health-related behaviours within participants' control.

Second, the Mini-*K* Short Form (Figueredo et al., 2006) was chosen to measure participants' life history tempo (*r-K*/fast-slow). The 20-item Mini-*K* is a concise version of the 199-item Arizona Life History Battery (ALHB, Figueredo, 2007), and was chosen over the full measure to alleviate participant burden. The Mini-*K* consists of items that tap cognitive and behavioural indicators of life history strategy, and is derived from the broad-ranging subscales of the full ALHB. It encompasses assessments of personal insight and control, familial relationships, romantic relationships, altruism and religiosity. It has demonstrated good internal consistency in previous research, and has a record of being used in study of the Dark Triad (Jonason et al., 2010; McDonald et al., 2011).

Measures of longevity are more difficult to select as there is a paucity within current psychometric literature of tests that assess this outcome. Thus, we were forced to consider alternatives. Providers of life insurance (banks; dedicated companies)

often use lifespan calculators in determining aspects of customers' policies. As it is in both providers' and customers' interests to ensure a high degree of accuracy - and successful companies have been providing life insurance for decades, or even centuries - we adopted the logic that a measure of this nature would be appropriate for the purposes of this study. After considering a number of candidate measures, we selected a 33-item longevity calculator provided by an Australian financial services company that has measured the lifespan of its clients relative to their behaviours for more than 150 years (AMP, 2013). The calculator makes longevity predictions based on metrics derived from that information. Items assess height and weight (BMI), stress, exercise, diet, driving and workplace behaviours, toxin consumption (e.g., alcohol/tobacco/recreational drugs) and living habits (e.g., location). Participants would be directed to the website that hosts this measure and asked to report their predicted lifespan. Having selected these inventories, we established our hypotheses as follows:

H1: That narcissism would predict fewer health-averse behaviours than psychopathy, as measured by the LTCC.

H2: That narcissism would be a positive predictor, and psychopathy a negative predictor, of life expectancy, as measured by the AMP Calculator.

H3: That narcissism would predict a 'slower' life tempo, and psychopathy a 'faster' tempo, as measured by the Mini-K.

Below are the method, results, and analyses that form my contribution to the project (Study 3). I include the abstract by way of providing an overview of the project, and include, in my reflection section, a discussion of both my own results, and a brief summary of the findings of other studies for reference, given their applicability to the broader conclusions drawn.

Dorian Gray without his portrait: Psychological, social and physical health costs
associated with the Dark Triad³⁹

Abstract

We examined how the Dark Triad (i.e., narcissism, psychopathy, and Machiavellianism) traits - as different social strategies - were associated with various health outcomes. In samples of American undergraduates ($N = 1,389$), Australian high school students ($N = 2,023$), and British undergraduates ($N = 280$), we examined the physical, social, and psychological costs associated with the Dark Triad traits. Narcissism was linked to few mental and physical ailments, suggesting it may provide a social buffer from negative health outcomes (Studies 1 and 2). Psychopathy (Studies 1 and 2) and Machiavellianism (Study 2) were linked to a number of psychological and physical health conditions. In addition, psychopathy was related to diminished life expectancy, whereas narcissism was related to enhanced life expectancy (Study 3). Our findings provide evidence that each of these personality traits is linked to various psychosocial trade-offs and different methods of coping with stress and adaptive problems.

³⁹ Jonason, P. K., Baughman, H. M., Carter, G. L., & Parker, P. (2015). Dorian Gray without his portrait: Psychological, social, and physical health costs associated with the Dark Triad. *Personality and Individual Differences*, 78, 5-13.

Study 3

Studies 1 and 2 relied on a variety of measures to assess the links between the Dark Triad traits and health. These measures could be criticized for being too general and simply replicating (and extending) prior studies. Moreover, we used contentious (Study 1) and untested (Study 2) measures of the Dark Triad. Therefore, we examine the Dark Triad traits in relation to life expectancy and health-related behaviors using an alternative measure of the former (Jones & Paulhus, 2014). We predicted that the fast life strategy linked to psychopathy would be related to lower life expectancy (Del Guidice, 2014). However, Machiavellianism is not well linked to this fast life strategy (Jones & Paulhus, 2009), and therefore we did not expect it to be associated with life expectancy, particularly so when the shared variance with psychopathy is controlled for. Given the value that those high in narcissism place on social connections (Bogart, Benotsch, & Pavlovic, 2004), it is possible that narcissism may be linked to enhanced life expectancy despite the reasons they may desire others in their lives.

Method

Participants and procedure

Two hundred and eighty individuals (16% men), aged 17–58 ($M = 20.21$, $SD = 4.90$) completed a battery of online questionnaires which included measures of the Dark Triad, life expectancy, health-related attitudes and behaviors, and life history. They were primarily recruited through the University of Durham (U.K.) internal participant pool advertising board; students were given course credit for their participation.

Measures

To measure the Dark Triad, we used the Short Dark Triad (Jones & Paulhus, 2014). Participants indicated agreement (1 = strongly disagree; 5 = strongly agree) of

27 statements such as “People see me as a natural leader” (i.e., narcissism), “Most people can be manipulated” (i.e., Machiavellianism), and “Payback needs to be quick and nasty” (i.e., psychopathy). Items were averaged to create indices of narcissism (Cronbach’s $\alpha = .73$), Machiavellianism ($\alpha = .68$), and psychopathy ($\alpha = .70$)⁴⁰.

We assessed participants’ expected lifespans with the AMP Longevity Calculator (AMP, 2013). The 33-item longevity calculator is provided by AMP, an antipodean financial services company that offers life insurance to clients. AMP has been measuring the lifespan of its clients relative to their behaviors for more than 150 years; this calculator is based on metrics derived from that information. Items include questions that assess Body Mass Index (i.e., BMI), hereditary disease, stress, exercise, diet, driving and workplace behaviors, educational levels, toxin consumption (e.g., alcohol/tobacco/recreational drugs), and living habits (e.g., location). Participants were asked to fill in this calculator and report their anticipated life expectancy.

We assessed participants’ health-related behaviors with the Living to 100 Life Expectancy Calculator (Perls, 2013). The calculator was developed from the on-going New England Centenarian study run by Boston University School of Medicine. It is the largest of its kind, globally. Participants were asked how often (1 = not at all; 5 = regularly) they engaged in various risk factors (see Table 5). We wanted to also measure latent risk-taking based on these items. When we ran a Principle Components Analysis with various rotations we continued to find a two-factor solution. The second factor was exclusively composed of the reversed-keyed items; and recoding them so that high scores indicated more risk-taking failed to align all the items.

Therefore, we dropped these two items (i.e., sunscreen, seatbelts) and re-ran our

⁴⁰ Narcissism was significantly correlated with Machiavellianism ($r(278) = .28, p < .01$) and psychopathy ($r(278) = .37, p < .01$). Machiavellianism was significantly correlated with psychopathy ($r(278) = .48, p < .01$).

analyses with the remaining three items (i.e., risky sex, drug use, and alcohol). In this Principle Components Analysis (with a varimax rotation) we found one factor that explained 43.54% of the variance ($Eigen = 1.31$) with factor loadings between .58 and .67. We averaged these items to create an overall risk-taking measure.

We used the Mini-K Short Form (Figueredo, Cabeza de Baca, & Woodley, 2013) to measure life “speed” (r-K). The 20-item Mini-K is the shortened form of the 199-item Arizona Life History Battery (Figueredo, 2007). Participants indicate agreement ($-3 = \text{Disagree Strongly}$; $+3 = \text{Agree Strongly}$) with statements such as “I avoid taking risks”. Higher scores indicate a “slower” (high-K) life history strategy ($\alpha = .75$).

Results and discussion

Table 1 contains descriptive statistics and sex differences for the Dark Triad traits and Table 2 contains the same information for health indicators. In respect of the Dark Triad traits, men scored higher than women in narcissism, Machiavellianism, and psychopathy. Women also reported a higher life expectancy than men did, reflecting sex differences in this figure for the U.K. (Office for National Statistics, 2011), and cross-culturally (World Bank, 2013). For unhealthy behaviors, hardly any sex differences emerged. The only differences to achieve significance were men’s more frequent engagement with unprotected sex and injection-based (i.e., intravenous) drug use, and women’s greater use of sunscreen. In respect of life history theory, women had a “slower” life strategy and reported less risk-taking than men did.

Table 3 contains zero-order correlations between the Dark Triad traits, life expectancy, and unhealthy behaviors. It also contains standardized regression coefficients where all three of the Dark Triad traits were entered as predictors to

control for their shared variance. As expected by life history theory, K-scores and risk-taking were correlated ($r(278) = -.14, p < .05$) and psychopathy was the only part of the Dark Triad linked to K-scores and risk-taking after controlling for the shared variance (Jonason et al., 2010). Life expectancy was correlated with risk-taking ($r(278) = .30, p < .01$; $\beta = .27, p < .01$) and K-scores ($r(278) = -.27, p < .01$; $\beta = -.24, p < .01$) at the zero-order and multiple regression levels.

The associations were generally similar in men and women. Across all variables, there were only three exceptions to the latter. First, the correlation between narcissism and K was stronger ($z = -3.99, p < .01$) in women ($r = .21, p < .01$) than in men ($r = -.04$). Second, the correlation between narcissism and frequency of drinking was stronger ($z = 3.31, p < .01$) in men ($r = .41, p < .01$) than it was in women ($r = -.06$). Third, the correlation between psychopathy and frequency of drinking was stronger ($z = 2.19, p < .05$) in men ($r = .41, p < .01$) than in women ($r = -.12$). In terms of overall risk-taking, the correlation with narcissism was stronger ($z = -2.21, p < .05$) in men ($r = .35, p < .01$) than in women ($r = .01$).

We tested two sets of mediation models. First, we examined whether sex differences in life expectancy were mediated by the Dark Triad traits using hierarchical multiple regression (Step 1 contained participant sex; Step 2 included the Dark Triad traits). Step 1 was significant ($R^2 = .10, F(1, 278) = 22.99, p < .01$) as was Step 2 ($R^2 = .21, F(4, 275) = 18.17, p < .01$), indicating that the mediation was significant ($\Delta R^2 = .11, F(3, 275) = 12.95, p < .01$). We found evidence for partial mediation, whereby the sex difference (β) in life expectancy shrank from $-.31$ to $-.25$ but remained significant and it was localized to narcissism ($\beta = .29, p < .01$) and psychopathy ($\beta = -.29, p < .01$).

Second, we examined whether the associations between the Dark Triad traits

and life expectancy were mediated by individual differences in risk-taking and life history strategy (i.e., K-scores). This was done to test whether these two proximal factors acted as intermediate mechanisms leading to different life expectancies. In Step 1 we entered the Dark Triad traits and in Step 2 we entered risk-taking and K-scores. Step 1 was significant ($R^2 = .16$, $F(3, 276) = 17.11$, $p < .01$) as was Step 2 ($R^2 = .20$, $F(5, 274) = 14.80$, $p < .01$), indicated the mediation was significant ($\Delta R^2 = .06$, $F(2, 274) = 9.70$, $p < .01$). In Step 1, psychopathy ($\beta = -.36$, $p < .01$) and narcissism ($\beta = .29$, $p < .01$) predicted life expectancy. In Step 2, psychopathy ($\beta = -.22$, $p < .01$), narcissism ($\beta = .26$, $p < .01$), K-scores ($\beta = .13$, $p < .05$), and risk-taking ($\beta = -.22$, $p < .01$) predicted life expectancy. This suggests that both proximal factors may account for some of the life expectancy effects linked to the Dark Triad but there is unique variance that is not accounted for.

Reflection

The results supported our predictions. Regarding the first hypothesis, that narcissism would predict fewer health-averse behaviours than psychopathy, narcissism was only linked to only one health-averse behaviour - dangerous (unprotected) sex and intravenous drug use. This relationship was not significant in regression, however. Psychopathy, conversely, was correlated with all health-averse behaviours (and was a significant predictor of all except a lack of sunscreen use). Machiavellianism was only correlated with, and was a predictor of, a lack of sunscreen use. Machiavellianism was also a negative predictor of both smoking and drinking.

Our second hypothesis, regarding life expectancy, was also supported. Narcissism was a positive correlate and predictor of life expectancy, whereas psychopathy was a negative correlate and predictor of that variable. Machiavellianism was negatively correlated with life expectancy, but this relationship did not extend to it being a significant negative predictor. Our third hypothesis, that narcissism would predict a slower life tempo, was also supported (though it was not a significant correlate of *K*-score), and psychopathy negatively predicted *K*-score, indicating its association with a faster life history. Machiavellianism was a negative correlate of *K*-score, but not a significant predictor.

Results somewhat replicated the pattern reported by Jonason and colleagues (2010) regarding DT and what those authors termed 'risk-taking behaviours'. Several differences are worth noting, however. In the earlier study, although only psychopathy was a predictor of increased alcohol consumption, both narcissism and Machiavellianism also correlated with the behaviour. It is possible the discrepancy between that study and the present one has resulted from a difference in how items

were measured. Jonason and colleagues averaged drinks consumed by participants over “this week” (p. 435) and maximum drinks consumed in one week. Both are open to the artefacts of a ‘heavy week’: Fluctuation in drinking levels is not uncommon in student populations (e.g., Delk & Meilman, 1996). In addition, a potential failure to accurately recall the number of drinks consumed during the ‘maximum’ week arises; the day of the week on which the study was undertaken may also have affected results (no controls for these issues are mentioned). In the present study, we multiplied the number of days on which participants typically consumed alcohol by the quantity of alcoholic drinks consumed on those days, reflecting typical drinking behaviour over a normal week. The present result, of an exclusive relationship between higher levels of drinking and psychopathy, is also in keeping with the findings of Miller et al. (2010).

Other differences - and points of note - centre on Machiavellianism. In the present study, the trait was largely unrelated to harmful/risky behaviours, with the exception of a lack of sunscreen use. Although potentially damaging to health in the short- and long-term (e.g., sunburn; melanoma: NHS, 2014), the risks associated with not applying sunscreen vary substantially according to a number of other factors (length of exposure; skin type; case/family history). Machiavellianism was also a negative predictor of smoking and drinking, suggesting it may be somewhat ‘protective’ in respect of health-averse behaviours. Conversely, Jonason et al. (2010) found the trait to correlate with, but not predict, drinking behaviours, and to have no relationship with smoking. Machiavellianism has frequently proven the most difficult component of DT to definitively position. One relevant example: At times the trait has shown a relationship with, and at other times no relationship with, impulsivity. Relationships between Machiavellianism and other variables seems to differ substantially according to the measure of DT used (Jonason & Tost, 2010) or sample

type (Jones & Paulhus, 2011). The present results, using the SD3 in a largely student sample, tentatively support a conclusion that the trait is not related to a particularly impulsive behavioural style - at least in respect of major health-related activities. Indeed, as a negative predictor of smoking and alcohol intake, one could conclude that the trait reflects a rather restrained lifestyle, and is aligned with a ‘protective’ (narcissistic) than ‘destructive’ (psychopathic) approach to life. This would be in keeping with the trait’s relationship with long-term planning (Jones & Paulhus, 2009).

Our results also suggest that whilst in other respects Machiavellianism may be a ‘darker’ trait (Egan et al., 2014; Pailing et al., 2014), efforts to establish it as one half of a ‘dark dyad’ (with psychopathy, set apart from narcissism) should consider a broad array of fitness-related outcomes before presenting conclusions. Although the traits share a number of similarities (e.g., McHoskey, Worzel, & Szyarto, 1998; Egan, Hughes & Palmer, 2015; Horan, Guim, & Benghart, 2015), they differ in a number of critical respects, as evidenced by the current research. Replication of our results, either with another measure of DT (e.g., the original long-form measures; the Dirty Dozen: Jonason & Webster, 2010) or even other measures of Machiavellianism (such as the IRT-informed Trimmed MACH: Rauthmann, 2013) - might prove instructive.

In terms of limitations, the present sample was fairly young, which may have affected results. Available evidence suggests that young people tend to future-discount more than older people (e.g., Green, Fry, & Myerson, 1994), although this may differ according to the behaviour in question. In relation to, for example, unprotected sex, Daly and Wilson (1995) argue one might expect that where time is “running out” in a man’s lifespan, risking “one last fertilization” (p. 56) would be logical; this could be extended to women who are nearing the end of their fertile life. In any case, the use of a sample with a wider age range to supplement current findings would be prudent.

This would also allow exploration broader correlates of these behaviours (and outcomes) across the lifespan.

In addition, whilst the Mini-K has proven a popular measure of life history strategies, a recent paper (Copping, Campbell, & Muncer, 2014) has recommended caution in the use of this and comparable measures (the full ALHB; the High-K Strategy Scale: HKSS; Giosan, 2006), calling for a broader use of longitudinal measures that focus on fitness outcomes more so than cognitive or behavioural measures of life tempo. Whilst understandably beyond the remit of the present study, which might best be described as a provisional (or ‘signpost’) undertaking, this call could be answered by future research that would greatly enhance collective understanding of both life history and DT. Definitive longitudinal data would also be of value in respect of work on longevity and DT, reducing dependence on reliable, if necessarily speculative, measures.

Nonetheless, in the present work, the finding that narcissism, in contrast to psychopathy, is a positive correlate and predictor of extended lifespan and of a ‘slower’ life history, sits well with existing knowledge. In the other studies that comprised this collaboration, amongst Australian high school students ($N = 2,023$), narcissism was positively associated with hope, self-esteem, and well-being attributions (except affective empathy); Machiavellianism was related to poor mental/psychological health across all measures; psychopathy was negatively related to hope, and emotional and psychological well-being, but positively related to self-esteem. In a sample of Canadian undergraduates ($N = 299$), few health-related results emerged. Machiavellianism was positively correlated with the number of times participants were ill, annually, and narcissism was positively correlated with the overall number of physical disorders participants reported they had experienced. This

study was, on reflection, considered to be rather limited, largely because of its sample: A young population from a country with universal healthcare is not likely to have experienced many health problems. It is additionally pertinent to note that, across all these studies, hardly any sex differences in DT-health correlates or DT-health predictive models emerged.

Generally speaking, these results were consistent with both expectations and existing literature: The darkest aspects of DT (psychopathy, and at times, Machiavellianism) were linked to various psychological and physical health problems, although Machiavellianism differed from psychopathy in that the former was not particularly linked to life expectancy (controlling for shared variance) and related to a safer, slower approach to life than the latter (Jonason et al., 2010; Jones & Paulhus, 2009). Both traits, however, were still more ‘costly’ than narcissism. Narcissism was associated with fewer mental and physical ailments, as well as a greater number of positive mental/cognitive/psychological states, supporting the notion that there may be beneficial health outcomes linked to the trait.

In the study presented above, we considered overall life expectancy as well as a measure of life history (*K*-score), and a series of behaviours that have repeatedly been linked to long-term health outcomes (e.g., smoking, drinking, drug use). Results supported two emerging suggestions relating to the study of DT: (1) that narcissism is somewhat ‘protective’, in predicting a longer lifespan and slower life tempo; and (2) this amounts to a ‘trade-off’ within DT, in that narcissism does not share a relationship with the harmful health-related behaviours that are associated with psychopathy. The present evidence suggests Machiavellianism falls in between the other DT traits, but is ‘lighter’, rather than ‘darker’, relative to health outcomes.

Beyond the current work, additional research has attested to the resistance that

social engagement (most closely connected to narcissism) affords against increasingly prevalent, and compounding, mental health issues over the lifespan (e.g., House et al., 1988). Evidence, noted above, has also indicated narcissism's relationship with functional, rather than dysfunctional impulsivity (Jones & Paulhus, 2011). Taken together, alongside the lack of association between narcissism and health-averse behaviours in the present study, this body of evidence serves as a formative explanation for our findings regarding longevity and life history. These results would benefit from further substantiation, but the results of the present study are supported by (and in turn, endorse) previous work.

The results relayed above also lend support to a key finding as reported in Chapter 4 regarding the comparability of high-DT men and women. To clarify, this does not refer to *levels* of DT scores (the present results show comparable DT sex differences typical of student-aged samples; e.g., Jonason et al., 2009), but *similarity* in correlates and outcomes. This collaboration indicated that, when DT traits are present, they manifest in highly comparable ways in men and women. Indeed, across all the studies in the published work, well-established sex differences in health outcomes (Macintyre et al., 1996; Piccinelli & Wilkinson, 2014; Shumaker & Hill, 1991; Sweeting, 1995; Verbrugge, 1989) were partially accounted for by individual differences in the DT traits.

In conclusion, the study presented above, and those it accompanies in its published form, address the call (Friedman & Kern, 2014) to assess personality and health in respect of DT. We provide preliminary evidence that attests to the costs of engaging in various life strategies, as manifest by particular personality traits (Buss, 2009; Nettle, 2007). We also support earlier work linking the Dark Triad to health behaviours, but report a number of differential relationships between the traits and

outcomes that highlights the need to measure all three traits of the constellation together (Paulhus & Williams, 2002). In doing so, we have reinforced concepts of varying degrees of ‘darkness’ across DT, with narcissism as the most beneficial, and psychopathy the most costly of the trio. Ultimately, in the first study of its kind, we have connected the DT traits, differentially, to a number of health-related behaviours, and to predicted longevity; we encourage future work on related topics, so as to further expand our understanding of the fitness-related costs and benefits of this trait constellation.

Table 1

Descriptive statistics and sex differences in the Dark Triad traits in British sample

	<i>M</i> (SD)			<i>t</i>	<i>d</i>
	Overall	Men	Women		
DT Composite	2.59 (0.41)	2.87 (0.53)	2.53 (0.35)	-4.20***	0.76
Narcissism	2.71 (0.56)	2.92 (0.68)	2.68 (0.52)	2.29*	0.39
Machiavellianism	3.11 (0.53)	3.36 (0.67)	3.07 (0.49)	2.91**	0.49
Psychopathy	1.94 (0.50)	2.34 (0.59)	1.86 (0.44)	5.17**	0.92

Note. * $p < .05$, ** $p < .01$, *** $p < .001$; *d* is Cohen's *d* for effect size

Table 2

Descriptive statistics and sex differences for indicators of physical health in British sample

	<i>M</i> (SD)			<i>t</i>	<i>d</i>
	Overall	Men	Women		
Life Expectancy	87.08 (9.82)	80.17 (9.51)	88.43 (9.32)	-5.48**	-0.88
<i>K</i> -score	5.38 (0.59)	4.99 (0.62)	5.45 (0.55)	-5.01**	-.078
Overall risk-taking	1.59 (0.53)	1.83 (0.76)	1.54 (0.46)	3.48**	0.46
Frequency of smoking	1.33 (0.84)	1.61 (1.11)	1.28 (0.77)	1.94	0.35
Drinking alcohol	2.02 (0.68)	2.13 (0.93)	2.00 (0.62)	0.91	0.16
Dangerous sex/ intravenous drug use	1.41 (0.89)	1.76 (1.29)	1.34 (0.79)	2.13*	0.39
Seatbelt wearing	3.72 (0.66)	3.61 (0.77)	3.75 (0.64)	-1.31	-0.19
Sunscreen use	2.48 (0.89)	1.85 (0.82)	2.59 (0.86)	-5.46**	-0.78

Note. * $p < .05$, ** $p < .01$; *d* is Cohen's *d* for effect size

Table 3

Correlations (and regression betas) between the Dark Triad traits, life expectancy, and unhealthy behaviours in British sample

Health Indicators	$r (\beta)$		
	Machiavellianism	Psychopathy	Narcissism
Life Expectancy	-.17** (-.07)	-.29** (-.37**)	.13* (.29**)
K-score	-.26** (-.12)	-.41** (-.47**)	.10* (.31**)
Overall risk-taking	.02 (-.18**)	.32** (.39**)	.14* (.05)
Smoking (tobacco)	-.03 (-.19*)	.25** (.35**)	.43 (-.04)
Drinking alcohol	-.02 (-.11)	.13* (.17*)	.07 (.04)
Dangerous sex/intravenous drug use	.09 (-.05)	.25** (.24**)	.16* (.08)
Seatbelt wearing	-.08 (.04)	-.23** (-.26**)	-.05 (.04)
Sunscreen use	-.26** (-.21*)	-.21** (-.12)	-.09 (.01)

Note. * $p < .05$, ** $p < .01$

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Background

When the Dark Triad was first discussed as a constellation of related yet ultimately distinct traits (Paulhus & Williams, 2002), the means by which each of narcissism, Machiavellianism, and psychopathy were measured was typically through a trio of independent scales. Most frequently, these were the Narcissistic Personality Inventory (NPI, Raskin & Hall, 1979; Raskin & Terry, 1988), the Mach-IV⁴¹ (Christie & Geis, 1970), and the Self-Report Psychopathy scale (SRP II/III) (Paulhus, Neumann, & Hare, 2009; Williams & Paulhus, 2004). Psychopathy has also often been measured by the Levenson self-report psychopathy scale (Levenson, Kiehl, & Fitzpatrick, 1995).

For reasons of reducing participant fatigue, minimising response bias, and standardising response format (the NPI contains dichotomous questions; Mach-IV responses are on a Likert scale), Jonason and Webster (2010) introduced a concise measure of DT: the Dirty Dozen (DD). At 12 items, what the DD measure may sacrifice in tapping the more subtle distinctions of DT - for example, between components within psychopathy – it compensates for in its brevity, and for that brevity, its reliability. Additionally, the DD inventory was created to facilitate the easy assessment of the DT traits as a single latent construct, as well as three related traits, which is desirable, in respect of recommendations as to the importance of the ability assess each trait, as well as capture their shared variance and overlap (Paulhus & Williams, 2002; Furnham, Richards, & Paulhus, 2013).

⁴¹ Although later versions (i.e., the Mach-V) have been developed, these were not found to improve upon the Mach-IV in terms of reliability and, amongst other problems, had issues with socially desirable responding (Fehr, Samson, & Paulhus, 1992; Shea & Beatty, 1983).

The scale construction paper (Jonason & Webster, 2010) presented strong results regarding the factorial structure of the DD, its test-retest reliability over a three-week period, the replication of well-evidenced relationships between the DT traits and other personality constructs (e.g., the Big 5), and its compatibility with the original DT measures. Subsequent work has suggested the measure has some strength in respect of the HEXACO model, and the honesty-humility element of personality (Jonason & McCain, 2012). Item Response Theory analysis has also yielded results that indicate men have a lower threshold for endorsement of items than women, in keeping with well-replicated (but not universal) sex differences in scores (Webster & Jonason, 2013).

Scrutiny of the DD by other researchers has raised issues pertaining to its measurement of the traits, however. In particular, the creation of a new short-form method of assessing DT – the Short Dark Triad, or SD3 (Jones & Puhlus, 2014) - has prompted comparisons of the two inventories. One such paper to use both measures and compare results across them indicated that SD3 was a superior measure in relation to the HEXACO model, and that it was recommended “if one is interested in measuring each of the Dark Triad variables in its own right, so that unique as well as common variance is emphasized” (Lee et al., 2013, p. 180). Other work also suggests that the SD3 is more comparable in its assessment of DT to the earlier, full-length measures than the DD (Maples, Lamkin, & Miller, 2014).

Research into these issues will no doubt persist for some time. Both measures have strengths, and both have limitations: For example, the DD was found to better-capture both grandiose and vulnerable elements of narcissism, whereas the SD3 only reflected the former (Maples et al., 2014). Both measures are therefore likely to face continued scrutiny, as they are used over time; this Chapter represents my own

formative contribution to the literature in this respect. I use Mokken analysis (Mokken, 1971), a form of psychometric analysis based on IRT that, although not used extensively (and often unfamiliar to researchers) nevertheless brings an important perspective to bear on the validity and strength of measures' scales, subscales, and individual items. I focused on the Dirty Dozen as that measure has been the one I have predominantly used in my research (the SD3 not emerging until close to the end of my studies – though it does feature in Chapter 7). The paper below applies Mokken analysis to the Dirty Dozen items across four distinct groups of participants: student-age men ($n = 135$, $M_{AGE} = 20.50$) and women ($n = 144$, $M_{AGE} = 19.57$), and older, non-student men ($n = 241$, $M_{AGE} = 34.10$) and women ($n = 224$, $M_{AGE} = 36.73$), allowing comparisons across sex and age, two factors that may have a bearing on participants' responses to the items (see, e.g., Webster & Jonason, 2013; Chapter 4, this submission). I reflect on my findings in a section following the paper as it currently exists, under review.

The Dark Triad 'Dirty Dozen': A Mokken analysis of sex differences in item structure⁴²

Abstract

The Dark Triad (DT: Machiavellianism, narcissism, and subclinical psychopathy) have often been measured using a 12-item scale: The 'Dirty Dozen'. Many articles report participants' scale scores as well as their total score because structural models, based on classical test theory analysis, have indicated DT can be represented both as three correlated scales and a single scale. As DT are proposed to underlie a 'male' reproductive strategy of short-term, low-investment mating, sex differences have been of particular theoretical interest. Using two samples – one of student-aged participants; another comprised of a broader national sample – we applied Mokken analysis to investigate whether the same hierarchical structure existed across sex and age. For student women, the exclusion of one psychopathy item produced a single hierarchical DT scale. For student men, items formed a three-item narcissism scale and a six-item Machiavellianism–psychopathy scale. For non-student women and men, all twelve items constituted a unidimensional DT scale. Across all groups, item 'difficulty' was similar: Narcissism items were most easily endorsed and psychopathy items had the lowest rate of endorsement. Results are discussed in relation to the problematic empirical status of the Dirty Dozen psychopathy subscale, and in relation to sex and age differences.

⁴² Carter, G. L., Campbell, A. C., Muncer, S., & Carter, K. A. (2015). A Mokken analysis of the Dark Triad 'Dirty Dozen': Sex and age differences in scale structures, and issues with individual items. *Personality and Individual Differences*, 83, 185-191.

1. Introduction

The Dark Triad of personality (DT: Machiavellianism; narcissism; subclinical psychopathy) has received considerable empirical attention since the concept appeared, just over a decade ago (Paulhus & Williams, 2002). The traits that comprise the Triad can each be measured with a separate inventory: For narcissism, this is the Narcissistic Personality Inventory (NPI, Raskin & Terry, 1988), which consists of 40 dyadic statements; for Machiavellianism, it is the 20-item Likert-scale Mach-IV (Christie & Geis, 1970), and for psychopathy, it is the Self-Report Psychopathy questionnaire, the most frequently-used version being the 31-item Likert-scale SRP-III (Paulhus, Neumann, & Hare, 2009). However, a total of 91 items across three measures (often in conjunction with other inventories) is burdensome to participants.

To address this, Jonason and Webster (2010) developed a 12-item inventory called the ‘Dirty Dozen’ (DD). Correlations between DD subscales and original measures used to evaluate the three constructs ranged between $r = .34$ and $r = .47$. Internal consistency ($\alpha = .83$) and test-retest reliability ($r = .89$) were both high. There was also evidence of construct validity: Correlations between the DD and other inventories (e.g., measures of the Big 5) showed predicted results patterns; subsequent research has supported and extended these findings (Jonason & McCain, 2012; Lee & Ashton, 2005). Since its development, the DD has been cited or used in peer-reviewed, DT-related papers more than 60 times; it is also the focus of the present study.

Whatever instruments are used, a key issue with the DT construct has been the extent to which the traits should be considered as three correlated scales, or as constituting a single scale (Furnham, Richards, Rangel, & Jones, 2014). Exploratory and confirmatory factor analyses have been used to examine this issue (Jonason, Li, &

Buss, 2010; Jonason, Li, Webster, & Schmitt, 2009). Although confirmatory factor analyses used in the development of the DD concluded that a model specifying three correlated constructs fitted the data better than a single-factor model (Jonason & Webster, 2010), later analyses (Jonason & Luévano, 2013; Jonason, Webster, Kaufman, & Geher, 2013) concluded that a bi-factor model (with items loading on both a general factor and three separate factors) showed the best fit to DD data. Structural equation modelling (SEM), conducted in relation to mate retention strategies and sociosexuality, indicated the former was best explained by a three-measure model, and the latter by a single-measure model (Jonason, Kavanagh, Webster, & Fitzgerald, 2011). Because of disagreement about the use and interpretation of multivariate models (Furnham et al., 2014), there is on-going debate as to whether high correlations between the traits constitute grounds for believing they may represent a single latent construct. Consequently, many authors report both subscale and composite DD scores.

Increasingly, psychologists are moving beyond classical test theory (CTT) in evaluating psychometric measures. CTT is predicated on item correlations that test whether people respond similarly to items intended to measure the same trait. Most traits are normally distributed, and individuals endorse some items and not others (Watson, Deary, & Austin, 2007). Two individuals could therefore receive the same trait score despite having endorsed non-overlapping items. For example, in a test of arithmetic ability, someone who correctly answered ' $2 + 2 = ?$ ' would receive the same score as someone who correctly answered ' $234 - 56/4 = ?$ '. Item response theory (IRT), however, examines items' structure by ordering them according to difficulty. It is based on the premise that an individual who achieves a high overall score would be more likely to get the latter question correct than someone who gets a

lower overall score. This can also be applied to personality traits, to reveal hierarchical item structure.

Webster and Jonason (2013) used multidimensional IRT to evaluate the DD's item structure. Item discrimination (the degree to which an item can discriminate between people with the same level of the latent trait) was adequate, while analysis of item difficulty (the amount of the latent trait necessary to have a 50% chance of endorsing the item) was quite low, suggesting the social undesirability of items created a high endorsement threshold. This was particularly true for psychopathy and Machiavellianism items. The possibility that men and women respond differently to DD items is pertinent because evolutionary psychologists have argued that DT underlies a male-typical strategy of short-term, low-investment mating (e.g., Jonason et al., 2009). The possibility that individuals of student and older, non-student adults age may respond differently to DD items is important because most work on DT is, largely for convenience, conducted with student samples, yet personality traits do not typically show evidence of changing over the human lifespan (Nettle, 2007). It is therefore important to demonstrate that DD items function invariantly over sex and age because the validity of assertions regarding the administration of the DD as a universal measure of DT depends upon this. Webster and Jonason (2013) examined differential scale functioning in relation to sex, and found that men had lower endorsement thresholds, especially for psychopathy. However, because item-level data were not examined, conclusions cannot be reached about whether specific items functioned differently in men and women. This is a key aim of the present study. (Note that item differential functioning is distinct from a sex difference: The former indicates an item has a different 'difficulty' in relation to total overall score in the two sexes.) Age differences have seldom been studied in this field, but work that has been

conducted suggests that significant sex differences that are typical of DT traits when measured in most student samples (e.g., Jonason, Li, Webster, & Schmitt, 2009) are not invariantly replicated, particularly when samples are comprised of older participants (Carter et al., 2014b; James, Kavanagh, Jonason, Chonody, and Scrutton, 2014).

To explore these issues, we use Mokken analysis, a non-parametric form of IRT (Mokken, 1971; Molenaar, 1982). Although based on Guttman scaling, Mokken does not assume error-free data. Nor does it include assumptions about the sigmoid shape of item characteristic curves that can cause rejection of many items and so decrease the resultant measure's reliability. Two Mokken models have been outlined: The Monotone homogeneity model (MHM) and Double monotonicity model (DMM). These differ slightly in their requirements. Both require data to have unidimensionality (items assess the same latent trait), monotonicity (the probability of any given response is a non-decreasing function of that trait), and item independence (participants' response to any given item is not influenced by their response to other items). DMM additionally requires the non-intersection of items (such that item characteristic curves do not touch or overlap). Invariant item ordering (IIO) means that items can be ranked by difficulty (or endorsement frequency), allowing for hierarchical ordering. This requires the calculation of three coefficients. Coefficient H for each item provides a measure of scalability (and unidimensionality). From these values, an H coefficient for the full scale can be calculated, which indexes the extent to which items accurately order respondents. H^T reverses person-item roles, and thus indexes the extent to which individuals agree on item ordering (Sijtsma, Meijer, & van der Ark, 2011). Together, H and H^T are indicative of scale strength and structure. Ultimately, if a DMM fits the data, and IIO can be established, it can be concluded

that item ordering is robust across populations and sub-groups (Sijtsma et al., 2011). Mokken analysis works by building a scale in a ‘bottom-up’ fashion from item-level data. When an item relationship is found that cannot be incorporated into the first extracted scale, the process iterates to determine the second (and further) scales present in the data. If the best solution to the data matrix is a three-scale structure, the Mokken program will identify these scales and constituent items.

As noted, the DD measure has chiefly been used on undergraduate samples. The present study considers two samples separately. The first ($N = 279$) consists of a student sample typical of existing work on DT ($M_{age} = 20.02$). The second ($N = 465$) is comprised of a national sample ($M_{age} = 35.37$), recruited via an internet platform that functions in a similar way to Amazon’s “Mechanical Turk” system (Buhrmester, Kwang, & Gosling, 2011; Vernon, personal communication, 2014). Questionnaire responses were collected in standard Likert format. Mokken analysis was originally developed to deal with dichotomous (i.e., binary response) data of this kind, however, a model for polytomous data was subsequently introduced (Molenaar, 1982). We use these data to examine whether DD items constitute a single scalable dimension, whether scale structure varies between women and men, between student and non-student samples, and whether item difficulty varies as a function of sex. We also examined narcissism, Machiavellianism, and psychopathy subscales for each sex.

Study 1: Student sample

Participants

Two hundred and seventy nine individuals (48.39% men), aged between 18 and 34 ($M = 20.02$, $SD = 2.17$), completed the *Dirty Dozen*. They were recruited as a convenience sample via a departmental participant pool (course credit was awarded for participation) at a UK university.

Measure

The Dirty Dozen (Jonason & Webster, 2010) is a 12-item measure of DT, consisting of three four-item subscales for narcissism, Machiavellianism, and psychopathy (see Table 1 for items). Respondents indicated the extent to which they agreed or disagreed with how well each statement reflected their own personalities on a five-point Likert scale (1 = Not at all like me; 5 = Very much like me).

Demographic information (sex; age) was also gathered.

Study 1: Results

Data were analysed using ‘mokken’, a programme for the freely-available statistical software ‘R’ (van der Ark, 2007). Data from women and men were analysed separately.

Results for women

Loevinger’s H for the women’s sample is shown in Table 1. As noted, H is a measure of item scalability or the extent to which items appear in the same order. An H -value above .3 is the usual threshold for acceptability. The scale’s H -value should be above .4 to indicate a strong hierarchical structure (van Schur, 2003). An initial attempt to include all items on a unidimensional scale was unsuccessful. The overall scale had an unacceptable H -value (.23), and only two items (M1; M3) met the requisite threshold for acceptability. Relevant values are given in the first H column. Item P4 was completely rejected from the analysis. The automated item selection process suggested a three-scale solution (narcissism, Machiavellianism, psychopathy scales), which was more successful (second H column). However, for the psychopathy scale, items P3 and P4 had unacceptable H -values. As P4 demonstrated

the worst fit (and had not fit initially), it was removed⁴³. Re-running the remaining psychopathy items (third *H* column) returned an acceptable three-item scale. All items had *H*-values $>.3$, and the overall scale *H* was also acceptable (.33), if weak (Mokken, 1971). The three scales, encompassing 11 of the 12 DD items, were also checked for monotonicity and IIO. No item violated the criterion for monotonicity, and IIO violations were non-significant. The H^T values for each scale ($N = .34$; $M = .31$; $P = .32$) suggested that items had weak, but reasonable ordering (Ligtvoet, van der Ark, Bergsma, & Sijtsma, 2011). Scale reliability is estimated using *Rho*, a test-retest reliability coefficient; a value above .70 is considered to indicate a reliable scale (Molenarr, Sijtsma, & Boer, 2000). For each of these scales, reliability was good ($N = .74$; $M = .79$; $P = .58$). Overall, results indicated 11 of the DD items can be seen as constituting three subscales that represent narcissism, Machiavellianism, and psychopathy.

Results for men

The scalability of the DD items was more problematic for men, as is apparent from consideration of the Loevinger's *H*-values (Table 2). The first *H* column indicates that eight items had an initial *H*-value $<.3$ and the overall scale *H* (.25) was also below the acceptable threshold. Thus it is unwise to consider these items unidimensional. On this occasion, the automated item selection procedure suggested there were two scales. One of these was clearly identifiable as narcissism, consisting of the four narcissism items. N3 was flagged for removal, however. Item *H*-values are given at the bottom of the second column. The narcissism scale *H* was acceptable, but weak (.36). The removal of item N3 improved the scale *H* to .46. There were no

⁴³ Unless the program recommends otherwise, it is recommended to remove one item at a time, starting with the item with the lowest *H*-value (van der Ark, 2012), since other items' *H*-values may change with each item's removal (Stochl, Jones, & Croudace, 2012).

violations of monotonicity or IIO and the H^T value (.43) indicated a moderate IIO strength. For this scale, reliability was good ($Rho = .70$).

The other scale included Machiavellianism and psychopathy items. Because the previous scalability of these items would have been affected by the presence of the narcissism scale, a second Mokken analysis was conducted on these items only. The H -values for this scale appear in the top sections of the second H column. Items M3, P3, and P4 had unacceptable H -values and the overall H -value of this scale, was also weak (.32). The analysis was conducted again excluding those items automatically flagged for removal by the program (P3; P4). The removal of both improved the H -value of M3 and returned a six-item scale. The Loevinger H -values for this scale appear in the third column. Overall H indicated moderate strength (.42), and the scale had good reliability ($Rho = .78$). Monotonicity was acceptable, and although there was a violation of item ordering for item M2 in the Machiavellianism-psychopathy scale, this was non-significant. The H^T value of .23 indicates weak item ordering, but does not render the scale invalid: A low H^T (i.e., $< .30$) indicates that participants had difficulty distinguishing items in terms of their intensity (Meijer & Egberink, 2012), and that item response functions are not close together. Ultimately, however, so long as the H^T value is positive, IIO can be assumed (Ligtvoet et al., 2011; Ligtvoet, personal communication).

We then examined Machiavellianism and psychopathy subscales separately for the student male sample (Table 3). The Machiavellianism scale performed well, with item and scale H -values exceeding acceptable thresholds. There were no issues regarding monotonicity. Although H^T was poor (.18), it was positive, and Rho was good (.79). Again, the psychopathy scale was problematic, with items P3 and P4 emerging as anomalous. These items had poor scalability ($H = .24$; $H = .14$,

respectively), as a consequence of which the overall scale H was also unacceptably low (.29). With P4 excluded, the H -value for P3 improved (to .39), as did scale H , which rose to an acceptable level (.46) The H -values of the three included items were also above threshold.

Male and female data compared

Overall, data from women supported DT as a three distinct dimensions, corresponding to the three constituent DT traits, but data from men were more complicated. As measured by the DD, narcissism formed a separate scale for men. Furthermore, items P3 and P4 were not initially scalable for either sex, and analysis of the DD subscales identified the psychopathy measure as problematic. Only with the removal of item P4 could adequate scalability be achieved. Narcissism and Machiavellianism subscales showed adequate scalability for men. A similar pattern was found in the women's data.

The mean values for each item (Tables 1 and 2) provide a guide to item difficulty by sex, with higher values indicating 'easier' items (i.e., a lower threshold for endorsement). Although comparisons are complicated by the different number of scales uncovered for the sexes, there was a high degree of rank order similarity. For men and women, the same narcissism items represented the mildest indicators of DT: N1 ("I tend to want others to admire me") and N2 ("I tend to want others to pay attention to me"). The 'hardest' (or 'darkest') DT items were from the psychopathy scale: P1 ("I tend to lack remorse"), P2 ("I tend to be unconcerned with the morality of my actions").

Sex differences were found for six items, and in each case, men scored higher than women: N3, $t(277) = 3.02, p < .01$; M2, $t(277) = 2.30, p < .05$; P1, $t(277) = 4.16, p < .001$; P2, $t(277) = 3.51, p < .01$; P3, $t(277) = 2.78, p < .01$; P4, $t(277) = 4.49, p < .001$.

.001). Note that four of these items were from the psychopathy scale.

Study 2: Non-student sample

Participants

Although most work has been undertaken using a student sample, there are a number of issues associated with this depending upon participants that constitute this demographic (Sears, 1986). Many previous papers recommend the recruitment of individuals beyond a student age, and several studies have achieved this (e.g., Carter et al., 2014b). To establish whether the DD functions in a similar way in both student- and older-aged samples, we recruited 465 non-student-aged individuals (52.05% men), between 22 and 64 years old ($M = 35.37$, $SD = 9.20$). These individuals were recruited via a crowd-data provider (CrowdFlower) that permits UK-based researchers to use its services.

Measure

As before, participants completed *The Dirty Dozen* (Jonason & Webster, 2010) and provided demographic information (sex; age).

Results

Data were again analysed using the ‘mokken’ programme for ‘R’. Male and female data were analysed separately.

Results for women

The pattern of results for this sample was markedly different from the female student sample. H -values are given in the H column of Table 4. In this case, all twelve DD items had acceptable H -values (all $> .3$), and constituted a single scale. The overall scale H -value (.49) and Rho (.91) indicated a strong, reliable measure. The scale was also checked for monotonicity and IIO. No item violated the criterion for monotonicity, and IIO violations were non-significant. The H^T value (.24) was low,

but positive, supporting assumptions of IIO. Overall, results indicated the DD items can be seen as constituting a unidimensional measure for non-student women.

Next, we again examined subscales. Item and scale values were acceptable for all three traits, with all subscale items loading well (see Table 6).

Results for men

The scalability of a single 12-item DD measure for non-student men was comparable to that for non-student women. As with the non-student female sample, non-student male results differed from their student-age counterparts (Table 5). All 12 items had an initial H -value $>.3$ and the overall scale H (.43) was above the acceptable threshold ($>.4$). Scale Rho was also good (.90). Thus, all 12 DD items can be considered unidimensional. There were no violations of monotonicity or IIO. Again, H^T was low (.17), but still positive, allowing assumption of IIO.

We once again examined narcissism, Machiavellianism and psychopathy subscales (Table 6). All three scales performed well, with item and scale H -values exceeding acceptable thresholds. In contrast to the issues present in the student-sample data, all items loaded without issue.

Male and female data compared

Overall, data from women and men supported DT, as measured by the DD, as a unitary dimension. Whereas several items had been revealed to be problematic for student-aged men and women, and scale creation was not similar between sexes in the previous samples, for non-student men and women, a high level of comparability emerged. DD therefore assess DT in non-student-aged men and women in a similar way, with all 12 items loading onto a single scale for both sexes. Equally, subscales for narcissism, Machiavellianism and psychopathy show similar strength: No items fail to load onto their relevant subscales for either sex.

In respect of item difficulty (Tables 4 and 5), there was again a high degree of rank order similarity. For men and women, narcissism items again represented the mildest indicators of DT. N2 was the easiest for both sexes, followed by N1 and N3 for women, and N3 and N1 for men. Among the ‘darkest’ DT items were (as with students) from the psychopathy scale: P1, and P2.

In contrast to the student sample, significant sex differences were not found any of the DD items (all p -values $> .05$). Ultimately, the present data suggest that non-student men and women are highly comparable in their responses to the DD items.

General Discussion

Our results demonstrate that whilst the 12 DD items function both as a single scalable construct and as three separate sub-scales in non-student samples (male and female), they do not do so in a student-aged population. For the student group, women’s responses suggest the presence of three scales, whilst men’s data suggest narcissism and Machiavellianism–psychopathy (“dark dyad”) subscales. For student women, P4 (“I tend to be cynical”) does not load on either the aggregate scale or the psychopathy subscale. For student men, three items – P3 (“I tend to be callous and insensitive”), P4, and N3 (“I tend to seek prestige or status”) – do not load on an aggregate scale, and two of these items (P4 and N3) also do not load onto their corresponding subscales. These issues with the DD items in student-aged men are particularly problematic. The DD measure has been used extensively with student-age participants. DT, as assessed by DD, has been repeatedly endorsed as a personality constellation associated with a “male” approach to sexual strategy, involving a preference for short-term sexual relationships and a lack of concern about abandoning partners (Jonason, Webster, Schmitt, Li, & Crysel, 2012; Jonason et al., 2009).

For men, all four items assessing Machiavellianism and two assessing

psychopathy formed a joint scale. The potential for an elision of this kind has been hinted at in previous research. In developing the DD, Jonason and Webster (2010) found that item P2 initially (before re-phrasing) showed a higher loading on the Machiavellianism factor than the psychopathy factor. In addition, at subscale level, DD Machiavellianism correlated more highly with the SRP-III psychopathy measure than with the Mach-IV (Study 1). Similar findings were reported by Jonason and Luévano (2013), who found that DD subscales for Machiavellianism and psychopathy were equally correlated with the Mach-IV. Correlations between Machiavellianism and psychopathy are generally higher than between other trait combinations (Furnham et al., 2014). Of the Big Five personality traits, all three DT subscales show the strongest negative correlations with Agreeableness, but these are consistently larger for Machiavellianism and psychopathy than for narcissism (Furnham et al., 2014). The characteristics of these two traits also show considerable overlap. Machiavellian individuals have been described as cynical, manipulative, callous, amoral, cold, and selfinterested (Jones & Paulhus, 2009), whilst psychopathic individuals are defined as cunning, manipulative, callous, lacking in empathy, parasitic, impulsive, and antisocial (Hare, 1999). Whether these are separable personality types has long been questioned (McHoskey, Worzel, & Szyarto, 1998). Indeed, recent work using an alternative brief measure of DT (the Short Dark Triad (SD3), Jones & Paulhus, 2014) has conceptualised Machiavellianism and psychopathy as representing a ‘dark dyad’ (Egan, Chan, & Shorter, 2014; Pailing, Boon, & Egan, 2014). The present data suggest these traits are not distinct in student-aged men, at least in their measurement by the DD. Mean levels of endorsement suggest that psychopathy items may constitute the extreme end of Machiavellianism.

Psychopathy was the most problematic of the three subscales for both male

and female student-aged samples, reflecting issues raised by others (Maples, Lamkin, & Miller, 2014; Miller et al., 2012). Item P3 was rejected from the male Machiavellianism–psychopathy scale, and only loaded acceptably onto the female DT scale once Item P4 was removed. Item P4 did not form part of a DT scale in student women or a Machiavellianism–psychopathy scale in student men. As noted, P4 has also shown problematic loadings in classical test theory analyses of the DD (Jonason & Luévano, 2013). It also bears noting that four of the six items showing significant sex differences in the student-aged cohort were from the psychopathy subscale, and two of these were the problematic items P3 and P4. This supports findings that sex differences are greater and more consistent for psychopathy items and may be responsible for student men’s higher overall DD score(s).

Across all four samples, there was a high degree of similarity in the difficulty ranking of DD items. Narcissism items were consistently the ‘easiest’ to endorse, reflecting that trait’s more socially-acceptable behavioural manifestations, as compared with Machiavellianism and psychopathy, and in keeping with its positioning as the ‘brightest’ of the DT traits (Rauthmann & Kolar, 2012). Those items that were most endorsed (N1; N2) are, in essence, the least socially undesirable of the twelve DD items. Psychopathic items P1 and P2 were the least endorsed, together with item M4 (“I tend to exploit others toward my own end”) which is arguably the most antisocial of the Machiavellianism items. Indeed, in the non-student samples, where all items loaded acceptably, item M4 was harder to endorse than item P4. Items, like these, which refer to callousness and manipulation represent what Jones and Figueredo (2013) have termed the “heart of the Dark Triad” (p. 521). In the broader context of DT measurement, an additional short measure has recently been created: The SD3 (Jones & Paulhus, 2014). Mokken analysis could usefully be

applied to this measure, particularly in light of the fact that it uses quite different statements and has been suggested to be a more accurate measure of DT, and specifically of psychopathy (Maples et al., 2014; Miller et al., 2012).

5. Conclusions

The debate as to whether the three facets of the Dark Triad represent a single over-arching construct has operational as well as conceptual implications: How meaningful is a summed DT score? A lack of resolution to this question has resulted in researchers often reporting both subscale and total DT scores. However, this increases the number of statistical tests performed in relation to any DT correlate examined. Moreover, the current evidence suggests that such a figure is only meaningful for studies using non-student samples, where all DD items load on a single scale. For student or student-aged participants, the twelve DD items do not constitute a single scale, nor do they function as three separate subscales.

Attempts to examine the legitimacy of representing the traits as a single composite score have included exploratory and confirmatory factor analysis, regression, and SEM (Furnham et al., 2014). These techniques are based on correlations between items and scales. Mokken analysis asks the structural question in a different way: It assesses whether items designed to assess a unitary construct conform to a hierarchical structure such that individuals with ‘more’ of the trait endorse items of greater difficulty than those with ‘less’ of the trait. Our findings suggest that for non-student-aged samples, the DD constitute a unitary scale – but this is not true for student (or student-aged) samples. The three subscales function well across non-student-aged men and women, but less well for the younger demographic. For students, a summed DD score is misleading, combining, as it does, different constructs: For women, all three sub-traits load separately, and for men, narcissism

and “Machiavellian–psychopathy” subscales emerge. Furthermore, item P4 does not function on either composite or psychopathy scales for student men or women, and item N3 is similarly problematic for student men.

The structure of DD is therefore not invariant over age or sex. It is unfortunate that the scale functions better in older than younger participants, when so much previous work has been conducted with the latter demographic. It is also perhaps ironic that the items measuring DT (which has been associated with a “male” mating strategy) show greater coherence (i.e., more items load, and load better) among student women than among student men. Nonetheless, this lack of invariance means direct comparisons of composite DD scores between the sexes and across age groups may be misleading. In order to legitimately demonstrate sex and age differences, it is necessary to ensure that the measuring instrument performs in an equivalent way for all participants; the present analysis suggests that this criterion has not been met for the DD. For student samples, where sex differences are of interest, comparison of subscale, rather than composite scores is a safer option. Sex differences have most often been reported for psychopathy, yet this subscale has proven the most psychometrically problematic in this and other studies. In light of this, we encourage future research to consider statistical techniques beyond classical test theory in the exploration of the DD, alternative measures of DT, and other personality measurements.

Table 1

H-coefficients for *Dirty Dozen* items in the student female sample ($n = 144$)

Item	<i>H</i>	<i>H</i>	<i>H</i>	Mean
Machiavellianism				
M1. I tend to manipulate others to get my way	.31	.52		2.49
M2. I have used deceit or lied to get my way*	.27	.61		2.47
M3. I have used flattery to get my way	.25	.54		2.75
M4. I tend to exploit others towards my own end	.33	.58		2.06
Overall subscale		.56		
Psychopathy				
P1. I tend to lack remorse***	.13	.30	.37	1.71
P2. I tend to be unconcerned with the morality of my actions**	.23	.31	.31	1.63
P3. I tend to be callous or insensitive**	.18	.23	.31	2.16
P4. I tend to be cynical***	.17	.19	---	
Overall subscale		.25	.33	
Narcissism				
N1. I tend to want others to admire me	.21	.50		3.28
N2. I tend to want others to pay attention to me	.22	.53		3.07
N3. I tend to seek prestige or status**	.22	.39		2.65
N4. I tend to expect special favours from others	.22	.47		2.56
Overall subscale		.74		
Overall scale	.23			

Note. Items in bold flagged for removal at next stage

Significant sex difference (men exceed women), * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2

H-coefficients for *Dirty Dozen* items in the student male sample ($n = 135$)

Item	<i>H</i>	<i>H</i>	<i>H</i>	Mean
Machiavellianism				
M1. I tend to manipulate others to get my way	.36	.40	.48	2.64
M2. I have used deceit or lied to get my way	.35	.39	.45	2.74
M3. I have used flattery to get my way	.23	.25	.32	2.81
M4. I tend to exploit others towards my own end	.39	.46	.53	2.21
Psychopathy				
P1. I tend to lack remorse	.26	.33	.35	2.19
P2. I tend to be unconcerned with the morality of my actions	.30	.36	.38	2.02
P3. I tend to be callous or insensitive	.18	.22	---	
P4. I tend to be cynical	.11	.18	---	
Overall subscale		.32	.42	
Narcissism				
N1. I tend to want others to admire me	.23	.43	.53	3.47
N2. I tend to want others to pay attention to me	.21	.48	.50	3.04
N3. I tend to seek prestige or status	.18	.27	---	3.00
N4. I tend to expect special favours from others	.25	.28	.37	2.60
Overall subscale		.36	.46	
Overall scale	.25			

Note. Items in bold flagged for removal at next stage.
Item *H* should exceed .30; scale *H* should exceed .40

Table 3

Item and scale H -values for narcissism, Machiavellianism and psychopathy, student male sample

	H	H
Machiavellianism		
M1. I tend to manipulate others to get my way	.54	
M2. I have used deceit or lied to get my way	.54	
M3. I have used flattery to get my way	.47	
M4. I tend to exploit others towards my own end	.59	
Scale H	.53	
Rho	.79	
Psychopathy		
P1. I tend to lack remorse	.38	.49
P2. I tend to be unconcerned with the morality of my actions	.41	.50
P3. I tend to be callous or insensitive	.24	.39
P4. I tend to be cynical	.14	---
Scale H	.29	.46
Rho	.58	.70

Note. Item H should exceed .30; scale H should exceed .40

Table 4

H-coefficients for *Dirty Dozen* items in the non-student female sample ($n = 224$)

Item	<i>H</i>	Mean
Machiavellianism		
M1. I tend to manipulate others to get my way	.54	2.70
M2. I have used deceit or lied to get my way	.51	2.45
M3. I have used flattery to get my way	.45	2.65
M4. I tend to exploit others towards my own end	.56	2.21
Psychopathy		
P1. I tend to lack remorse	.49	2.25
P2. I tend to be unconcerned with the morality of my actions	.50	2.12
P3. I tend to be callous or insensitive	.48	2.14
P4. I tend to be cynical	.47	2.38
Narcissism		
N1. I tend to want others to admire me	.42	3.13
N2. I tend to want others to pay attention to me	.48	3.19
N3. I tend to seek prestige or status	.44	3.11
N4. I tend to expect special favours from others	.50	2.96
Overall scale	.49	

Note. Item *H* should exceed .30; scale *H* should exceed .40

Table 5

H-coefficients for *Dirty Dozen* items in the non-student male sample ($n = 241$)

Item	<i>H</i>	Mean
Machiavellianism		
M1. I tend to manipulate others to get my way	.49	2.61
M2. I have used deceit or lied to get my way	.41	2.45
M3. I have used flattery to get my way	.41	2.60
M4. I tend to exploit others towards my own end	.47	2.34
Psychopathy		
P1. I tend to lack remorse	.44	2.40
P2. I tend to be unconcerned with the morality of my actions	.45	2.27
P3. I tend to be callous or insensitive	.47	2.32
P4. I tend to be cynical	.43	2.57
Narcissism		
N1. I tend to want others to admire me	.41	3.05
N2. I tend to want others to pay attention to me	.37	3.17
N3. I tend to seek prestige or status	.44	3.10
N4. I tend to expect special favours from others	.44	2.86
Overall scale	.43	

Note. Item *H* should exceed .30; scale *H* should exceed .40

Table 6

Item and scale values for narcissism, Machiavellianism and psychopathy scales by respondent sex, non-student sample.

	Women	Men
Machiavellianism (Item <i>H</i>)		
M1. I tend to manipulate others to get my way	.65	.57
M2. I have used deceit or lied to get my way	.70	.49
M3. I have used flattery to get my way	.65	.53
M4. I tend to exploit others towards my own end	.69	.53
Scale <i>H</i>	.67	.53
<i>Rho</i>	.87	.80
Psychopathy (Item <i>H</i>)		
P1. I tend to lack remorse	.62	.61
P2. I tend to be unconcerned with the morality of my actions	.62	.58
P3. I tend to be callous or insensitive	.63	.63
P4. I tend to be cynical	.54	.54
Scale <i>H</i>	.60	.59
<i>Rho</i>	.84	.84
Narcissism (Item <i>H</i>)		
N1. I tend to want others to admire me	.63	.62
N2. I tend to want others to pay attention to me	.66	.62
N3. I tend to seek prestige or status	.64	.60

N4. I tend to expect special favours from others	.65	.61
Scale <i>H</i>	.65	.61
<i>Rho</i>	.88	.85
<hr/> <i>Note.</i> Item <i>H</i> should exceed .30; scale <i>H</i> should exceed .40		

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Reflection

The results from the present study cast doubt on the invariant functionality of the DD items across men and women, and participants of different ages. Mokken analysis is intended to show how individual items may be responded to differentially, which should not be taken for granted, even when items on a scale purport to assess the same state or trait. In this study, our run of Mokken analyses revealed that, beyond broad similarities between groups, such as narcissism items being easier to endorse than psychopathy items, the Dirty Dozen do not function as has been assumed, and age and sex are important factors that alter how individuals respond.

Additionally, at least one item is so problematic for student respondents that it does not function as part of any scale; the continued use of it in future studies that adopt the Dirty Dozen should therefore be considered extremely carefully, and a less ambiguous alternative might be appropriate. Seeking a replacement for this item would also potentially allow for the resolution of another issue raised in respect of the DD's problems: That of its limited capacity to tap subclinical psychopathy as envisioned as a theoretical construct. Whilst the current four items – three, once the problematic one is discounted – undoubtedly reflect the cold, emotionless side of psychopathy, they do not tap its fundamentally impulsive nature, which is a strong component of the trait, often considered a key component of Factor 1, or 'primary' psychopathy (e.g., Cooke & Michie, 2001; Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010; Jones & Paulhus, 2011). It is well-represented by items in both the original SRP-III⁴⁴ ("I enjoy doing wild things"; "I am an impulsive person") and in the SD3 ("People often say I'm out of control"), as well as other measures assessing psychopathy in clinical, or incarcerated populations (e.g., Hare, 1999).

⁴⁴ As well as the SRP-II (Williams & Paulhus, 2004).

More broadly, this difference is likely to affect the design of characters, such as my own from Chapters 1 and 2, based on this measure. Notably, in their creation of a psychopathic character, Jonason, Lyons, and Blanchard (2015) based their 'highly psychopathic' vignette on characteristics manifest in the SRP; indeed, their character is defined by their impulsive, sensation-seeking behaviour. (However, there is no reference to the emotional coldness that is a key component of that personality type.)

Without conducting a comparable analysis on similar groups for the SD3, I am presently unable to draw direct comparisons between that measure and the Dirty Dozen in respect of item and scale functionality. However, a large-scale project to do so is currently underway; when complete, it should further our understanding of the respective strengths and weaknesses of the two short-form measures that look set to continue to dominate study of DT. I reflect further on this, and on all my findings from across this submission, in my final chapter.

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Chapter 9: General Discussion

This section represents my concluding thoughts on my study of the Dark Triad (DT), drawing together reflections on my overall undertaking and the present state of study of DT. Accordingly, I make, or re-assert in an expanded manner, suggestions for the directions which future research could take to expand our knowledge of narcissism, Machiavellianism, and psychopathy as distinct yet overlapping traits.

The pace at which research on the Dark Triad has advanced in the years my Ph.D has spanned has been dramatic, and has increased substantially, year-on-year. Since 2010, the growth in interest in the construct, both in the scientific and popular press, has been considerable. Even since a recent 10-year review on the subject (Furnham, Richards, & Paulhus, 2013) was published, citation figures for the original work (Paulhus & Williams, 2002) and the quantity of peer-reviewed research papers on the subject have grown considerably. In terms of the (albeit relatively limited) history of the field to date, there has not been a time when such a wealth of literature has been produced, and on such a varied number of subjects. We now know a great deal about individuals characterised by high levels of narcissism, Machiavellianism, and psychopathy, from their entertainment preferences (Williams, McAndrew, Learn, Harms, & Paulhus, 2001) to their mating preferences (Jonason, Lyons, & Blanchard, 2015); from how they act in the boardroom (O'Boyle, Forsyth, Banks, & McDaniel, 2012), to how they act in the bedroom (Baughman, Jonason, Veselka, & Vernon, 2014). Many more articles – including ones I have authored or co-authored – are already in press, or will be submitted for peer review in the coming months.

Across the works presented in this thesis, I have attempted to address some of the gaps I believe(d) to exist in the field of DT research. Chapters 2 and 3 primarily

tackle the issue of methodological over-dependence on self-reported sexual success in relation to the attractiveness of people with DT traits (Jonason, Li, Webster, & Schmitt, 2009; Jonason, Koenig, & Tost, 2010).

The study in Chapter 2 found that, in a sample where student-aged women ($n = 128$) rated either a character created to represent high levels of all three DT traits, or a character created to represent an absence of these traits (a control character), the former received significantly higher attractiveness ratings. Participants were also asked for their perceptions of the characters. Via proxy questions, they correctly (relative to established literature and the intention in their creation) ascribed lower levels of Conscientiousness, Agreeableness and Neuroticism, and higher levels of Extraversion, and each of narcissism, Machiavellianism, and psychopathy to the character representing high levels of DT. SEM confirmed that participants' attractiveness ratings were significantly affected by character condition, independent of perceptions of their Big 5.

Chapter 3 expanded the methodology of the preceding project by recruiting male ($n = 100$) and female ($n = 109$) participants to rate the same characters (male participants saw a female headshot). We also measured participants' own levels of the DT traits, and asked participants how attractive they would find the character they saw as a short-term and as a long-term partner. Defying expectations from both the wider literature and Chapter 2, the study in Chapter 3 found no preference for the character with high levels of DT. Participants' own levels of DT did not affect their ratings, with the exception of highly-Machiavellian participants' lower ratings when considering the prospect of a long-term relationship.

The intention of these studies was to ascertain whether DT, at its core, can be considered an attractive personality – at least, at initial, limited exposure. It is

encouraging to see that a number of other researchers have recognized this issue and have also adopted alternative designs to consider it (Rauthmann & Kolar, 2013; Jonason, et al., 2015), as well as assessed other elements - dress; facial masculinity (Holtzman & Strube, 2013; Lyons, Marcinkowska, Helle, & McGrath, 2015), or even the external environment (Rauthmann, Kappes, & Lanzinger, 2014) - that may affect DT's perceived attractiveness. However, both my own results, and those of the broader body of researchers considering this subject, collectively amount to somewhat inconsistent findings, as to whether individuals with high levels of the DT traits are, or are not, attractive at a fundamental, personality level. This is possibly a methodological effect; even with what might be considered advances over self-report measures, issues still remain. Foremost among these is that the majority of research is confined to artificial assessment, either through the use of vignettes/created characters (true of my own work), or the use of actors to play DT or "cad" individuals (Durante, Griskevicius, Simpson, Cantú, & Li, 2012; Rauthmann & Kolar, 2013; Jonason et al., 2015). Whilst these studies have purported to create characters that accurately represent individuals high in the DT traits - and have a strong degree of face validity⁴⁵ - the way in which these characters are constructed to express these traits differs from study to study, and may be at least partly responsible for the difference in findings.

A further issue is that several studies have focused exclusively on one of the DT traits alone, without assessing the other two traits (e.g., Aitken, Lyons, & Jonason, 2013; Buffardi & Campbell, 2008; Holtzman & Strube, 2010; Visser, Pozzebon, Bogaert, & Ashton, 2010). This negates the analytical ability to account for any influential coexistence or overlap in the DT traits, and thus ascertain a full picture of

⁴⁵ It is unclear whether other researchers who have used created characters have conducted manipulation checks similar to that feature in Chapter 2 on their characters; if so, they are not reported.

their correlates and predictive outcomes (see, e.g., Chapters 4-8). This may especially be an issue in respect of Machiavellianism and psychopathy, which have frequently shown considerable comparability, both theoretically and empirically (Ali, Amorim, Chamorro-Premuzic, 2009; Egan, Chan, Shorter, 2014; Egan, Hughes, & Palmer, 2015; Fehr, Samson, & Paulhus 1992; Horan, Guinn, & Banghart, 2015; McHoskey, Worzel, & Szyarto, 1998; Rauthmann & Kolar, 2012; Pailing, Boon, & Egan, 2014); assessment of other outcomes also indicates similarities or overlap between narcissism and psychopathy (e.g., Rauthmann, 2011). Undoubtedly, the resolution of such issues within any one study would require a complex, real-world methodology, the practicality of which is challenging. Nevertheless, the field would greatly benefit from studies that take the study of DT beyond the laboratory and assesses a wide range of factors that differ between individuals with varying levels of DT, enabling us to understanding more fully the ways in which DT relates to mating⁴⁶. Such studies will, hopefully, also afford equal consideration to male and female raters.

In seeking to move beyond a prevailing focus on DT as “male” construct, Chapter 4 explored the comparability between men and women characterised by high levels of DT. Because of the self-reported sexual success (i.e., increased numbers of short-term mates) of men with high levels of the DT traits (e.g., Jonason, Koenig, & Tost, 2010), male-focused evolutionary arguments for the traits’ persistence (e.g., Holtzman & Strube, 2011), and frequent reporting of higher mean scores for men than women on trait inventories, women scoring highly for DT have frequently been overlooked. Unlike previous work, particularly those studies using student samples, this study, with a large, national sample ($N = 899$; $M_{AGE} = 39.5$), did not replicate expected sex differences in DT, despite reporting sex differences in other domains

⁴⁶ I propose some ways in which this could be taken forward with real individuals in the reflection section of Chapter 7.

where such differences are typically found (e.g., sensation-seeking; competitiveness). Correlations and predictors of DT were near identical across men and women, including in respect of variables relating to extra-pair sex. All associations were robust to moderation by sex. The initial paper only featured analyses based on composite DT, largely for reasons of word limit. Subsequent analyses at trait level (contained within that chapter's reflection section) indicate that this comparability extends beyond assessment of the composite trait.

The purpose of this undertaking was not to suggest that men and women scoring highly for the DT traits are identical in their attitudes and behaviours, but rather to explore whether they were similar in key areas, particularly those which relate to mating (i.e., an interest in pursuing extra-pair mating opportunities, favouring sex over romance, and engaging in recreational sexual activities⁴⁷). Other research has highlighted areas in which these men and women differ (e.g., Visser et al., 2010), or outcomes that are related to DT in both sexes, but are arrived at through different "routes" (e.g., Jonason, Lyons, Bethell, & Ross, 2013), in that the relationship with the outcome is differentially related to one (or more) individual DT traits in men and women. Other existing work reinforces a general sense that they are comparable (e.g., Jonason & Kavanagh, 2010; Jonason & Tost, 2010). Future work will, hopefully, continue to develop our understanding of where these men and women are similar, and where they differ – most importantly, the extent to which they may be alike in respect of traits or behaviours that typically show strong sex differences, not least, relative to mating.

Chapter 5 represents an attempt to expressly draw focus onto women who score highly for the DT traits, assessing how DT relates to various forms of

⁴⁷ Although the motivations and benefits for men and women scoring high for the DT traits to engage in sexual behaviour of this kind are likely to differ, as I suggest throughout this thesis.

competition within a single-sex sample. In a sample comprised of young women ($N = 439$; $M_{AGE} = 22.85$), all three DT traits (controlling for shared variance) were significant predictors of both general and sexual competitiveness. Narcissism was the strongest predictor of both form of competitiveness amongst DT traits.

Additionally, we sought to address the view of inter- and intra-sexual competition as readily separable constructs, which we argued is extremely fraught, especially for women. To explore this, we conducted a factor analysis on responses to items assessing four forms of sexual competition (self-promotion, competitor derogation, competitor manipulation, and mate manipulation), which was not undertaken in the original paper (Fisher & Cox, 2011). Results did not support a clear distinction between distinct tactics, as previously proposed, nor between inter- and intra-sexual forms of competition, instead suggesting one primary factor.

Whether the issue of forms of sexual competition is purely methodological, in that existing inventories (e.g., Fisher & Cox, 2011) do not fully establish each form of sexual competition, or theoretical, in that the two are in many cases indivisible, remains to be seen. Context and motivation may be salient elements that distinguish inter- from intrasexual competition, but these are difficult to control for and objectively assess. My own interpretation of the available data, and the paucity of methodologies that have produced a ‘clean’ division encourages me towards the conclusion that the two are inexorably entangled with one another. As a number of evolutionary and social psychologists have previously undertaken work on inter- and intrasexual competition (e.g., Buss, 1998), and on sexual competition and DT (e.g., Dussault, Hojjat, & Boone, 2013; Goncalves & Campbell, 2014; Holtzman & Strube, 2011; Jonason, Li, & Buss, 2010; Jonason, Lyons, Baughman, & Vernon, 2014), it seems likely that the issue will be revisited. It would also be valuable to obtain data

on male sexual competitiveness in relation to DT, and to compare the findings from such a sample with Chapter 5. In respect of assessment of DT, we were able to discern the individual contributions of each constituent trait in accounting for competitiveness and sexual competitiveness, finding that narcissism was the strongest predictor of both. In this study, we used the Dirty Dozen (Jonason & Webster, 2010), which as we note, assesses narcissism across items that can be read as likely to overlap with a desire to compete. Whether this outcome would replicate if alternative measures – the SD3 (Jones & Paulhus, 2014), or full-length DT measures (e.g., the NPI, Mach-IV, and SRP-III) – were used to assess the traits would provide insight into potential discrepancies in the way in which popularly-used inventories assess the DT traits.

Chapter 6 used a realistic, verbal and nonverbal behavioural methodology in an attempt to establish whether male and female individuals scoring highly for levels of the DT traits acted and spoke in ways that differed significantly from individuals with lower levels of the traits ($N = 30$). I found that composite DT predicted prolonged gaze duration, frequency of smiling, good posture, and projecting an image of physical comfort. It also predicted a sustained and eloquent verbal style (low use of filler words; longer speaking time). These behaviours were primarily linked to Machiavellianism, which additionally predicted gesticulation smoothness; narcissism and psychopathy also predicted gaze duration. The former additionally predicted physical comfort, whilst the latter predicted smiling frequency. Results suggest that the differences that emerged might serve to at least partially explain the (at least initial) successes of individuals with high levels of DT in mating-related and other social scenarios. As with the results from Chapter 4, men and women with high levels of DT were comparable in their behaviours, both at the composite and trait level. Follow-up research on this subject area could extend to recording behaviours in a

more naturalistic scenario, such the aforementioned speed-dating example, although this would likely involve a degree of pre-preparedness by participants that might mask their more naturalistic interpersonal presentational styles since, for example, highly-narcissistic individuals exert considerable control over how they appear to others when able (Buffardi & Campbell, 2008). In any event, replication with a large and more varied (i.e., non-student) sample would be desirable. Other work has utilised naturalistic scenarios in a dating-like context - at least, in respect of male-only courtship approaches, measuring women's reactions (Rauthmann et al., 2014) – but did not assess these men's specific behaviours. Research into narcissism has recorded verbal behaviours that distinguish high- and low-scorers for the trait (Holtzman, Vazire, & Mehl, 2010), but did not account for the potential contribution of the other DT traits. Overall, the field as a whole is relatively sparse. More work that assesses each of the DT traits' relationship with assorted verbal and nonverbal behaviours is undoubtedly warranted.

The research presented in Chapter 7 is the result of a multi-national collaboration that sought to address the “costs” of the DT traits relative to mental and physical health. Although the negative (if not always undesirable, on the part of the highly-DT individual) outcomes of relationships, social and romantic, were well-established, little was known about the specific links that might be expected to exist between the DT traits and individuals' long-term health. My primary contribution (Study 3; $N = 280$) centred on the physical health outcomes of DT; specifically, on the proposed trade-off between the costs of psychopathy and the benefits of narcissism. This and found that the former was by far the most “costly” of the three traits. Psychopathy was associated with truncated life expectancy, a ‘faster’ life tempo, and with higher levels of smoking, drinking, unprotected sexual activity and intravenous

drug use. In juxtaposition, narcissism was related to a longer life expectancy, a slower life tempo, and (in regression) no unhealthy behaviours. As with the results from Chapter 4, the pattern of results was similar for men and women. This is consistent with the general consensus that psychopathy is in many respects the darkest of Dark Triad: A substantial body of literature attests to the negative outcomes that are frequently associated with the trait, stemming from associated impulsivity and risk-taking (see, e.g., Glenn, Kurzban, & Raine, 2011). Conversely, there is a growing volume of work reflecting the protective or beneficial outcomes (that is, beneficial for the highly-narcissistic individual) that are associated with narcissism via their extremely social orientation (Carter, 2010; Jonason & Schmitt, 2012; Foster, Shriram, & Campbell, 2006). Overall, results fit reasonably well (but not perfectly) with existing work on health-related behavioural correlates of DT (Jonason, Koenig, & Tost, 2010).

A limitation of this sample, not addressed as such in the published paper, is that it was dominated by women (84%). Additionally, participants were mostly of a student age. Addressing both of these issues would be warranted in future studies on this issue, as both factors are relevant to the study of future-discounting and risky behaviours (e.g., Green, Fry, & Myerson, 1994). Nonetheless, as a formative exploration of an issue that had largely been overlooked, the work presented in this chapter provides support for prevailing expectations and acts as a signpost for continuing research into the subject.

Chapter 8 adopted a psychometric approach to bring together two issues I anticipate will be on-going for some time in the study of DT. The first pertains to its assessment. The Dirty Dozen, although an extremely popular measure with high levels of validity when evaluated via classical test methods (Jonason, Kaufman,

Webster, & Geher, 2013; Jonason & Luévano, 2013; Jonason & McCain, 2012; Jonason & Webster, 2010) and IRT (Webster & Jonason, 2013), has nevertheless attracted criticism for the way in which it reflects (or does not reflect) the theoretical construct of sub-clinical psychopathy (Maples, Lamkin, & Miller, 2014; Miller et al., 2012). Moreover, as I have demonstrated in Chapter 8, it does not function in a comparable way across ages and men and women (the latter, at least for student men and women). However, it would be premature to abandon it; items may be adjusted and revised in future, and the most contentious item - pertaining to individuals' "cynicism" – might usefully be replaced with a less fraught and subjectively-phrased item that aligns more with the core concept of psychopathy. Furthermore, the alternatives are limited: The long-form inventories are very burdensome to participants, especially when administering additional measures, and the recently-created short-form alternative (the SD3; Jones & Paulhus, 2014) has not yet been subjected to rigorous scrutiny across non-CTT assessment. My own experience with the measure to date suggests that there may be issues surrounding one particular psychopathy item: "I have never gotten into trouble with the law". Aside from the fact that this is, fundamentally, a binary item (though assessed, per the rest of the scale, as a Likert item), it has repeatedly returned floor effects in work I have undertaken (both in Chapter 7, and in forthcoming work). Subsequent testing may yield further evidence regarding the item's fit in its present form.

The second issue highlighted by the results of Chapter 8 is more fundamental: Whether DT traits continue to be assessed in their current tripartite form. Recently, some researchers (Egan et al., 2014; Egan et al., 2015; Pailing et al., 2014) have, with empirical support, attempted to re-align the Triad as a bi-factorial construct that reflects narcissism, and Machiavellianism-psychopathy, due to the underlying

similarities between Machiavellianism and subclinical psychopathy, and differences between these two traits and narcissism. The Mokken analysis undertaken in Chapter 8 goes some way to suggesting such a construct is reflected in DT's assessment by the Dirty Dozen within some populations. Although this division was not replicated across all samples in that study, it was nevertheless clear that narcissism (or narcissism items) were frequently 'apart' from Machiavellianism and psychopathy, whether in ease of endorsement, or in forming a separate scale. The other potential adjustment to the triad is the inclusion of sadism, thus reforming DT as the 'Dark Tetrad' (Buckels, Trapnell, & Paulhus, 2014; Chabrol, van Leeuwen, Rodgers, & Sejourne, 2009; Paulhus & Buckels, 2011). Sadism, defined by cruelty, aggression, and misanthropy has been proposed as an addition to the Dark Triad because of its comparable level of prevalence in adolescent populations, moderate correlation with the existing DT, and relative similarity in respect of certain correlates (Chabrol et al., 2009). This submission has not ventured into the debate between triad and tetrad: It is a relatively new area, even within DT research, and sadism's inclusion as the fourth member of a 'dark tetrad', over other correlates, is regarded as contentious by some (e.g., Porter, Bhanwer, Woodworth, & Black, 2014). Ultimately, this issue may well prove to be little more than a debate between 'lumpers' and 'splitters', but it is conceivable that future undertakings may necessitate the inclusion of sadism to avoid the criticism that any picture of the outcomes of the "darker side" of human personality is otherwise incomplete. Alternatively, given the similarity in correlates between Machiavellianism, psychopathy, and sadism, but not narcissism (e.g., Buckels et al., 2014), researchers may yet propose a re-formed Dark Triad with sadism replacing narcissism.

Conclusion

The research presented in this submission aimed to tackle a number of issues with the study of the Dark Triad that were apparent when I began my PhD. Naturally, many questions remain unanswered, and several of the existing answers to questions posed by the work in this submission remain incomplete. Nonetheless, with the aforementioned pace of current work, and the ever-increasing number of researchers who are venturing into this field, it seems unlikely that the study of this constellation of personality traits will slow in the near future. The appeal of DT to social and personality psychologists is understandable, possibly due to the attention that work in this area attracts in the popular press, and its ease in terms of communicability. More importantly, however, a growing body of evidence attests to the wide range of attitudes and behaviors that DT is related to, and at least partially explains important fitness outcomes. Broader, and more longitudinal work on areas that are currently under-studied, such as lifetime offspring and lifespan, as well as on other indicators of fitness (such as facial attractiveness and symmetry) would be of value, however.

The study of DT has most frequently been approached from a perspective informed by evolutionary psychology, which is becoming increasingly more accepted and adopted by the academic psychological community. Indeed, evolutionary psychology is often asserted to be the only metatheory that has the requisite tools to adequately explain human behaviour and individual differences (Buss, 1995; 2009; Buss & Penke, in press, Nettle, 2006; Penke, Denissen, & Miller, 2007). As both fields continue to advance, together, the highly-accessible research undertaken on DT will hopefully further interest in, and understanding of, evolutionary principles.

Whether DT, as a personality framework, truly represents a “rival to the Big 5” (Jonason et al., 2014, p. 117) is debatable; the two constructs have strong and well-established links, yet they explain different outcomes beyond one another (e.g.,

Chapter 2). It may be more apposite to view them as complementary frameworks, as the DT traits show a pattern of relationship (i.e., high levels of Extraversion, low levels of Agreeableness) with the Big Five that frequently emerge when the two are measured together (e.g., Chapter 4). Alternately, the HEXACO framework has been proposed to capture the essence of DT in its ‘honesty-humility’ component (Lee & Ashton, 2005, 2014). Time, and empirical research, will no doubt further these discussions.

Ultimately, however, I hope that my own contributions to the literature thus far have served in some way to draw attention to the importance of sex, age, measurement, and the simultaneous assessment of narcissism, Machiavellianism, and psychopathy in studying DT. Consideration of these issues, will, I believe, strengthen the field as future researchers continue to study the Dark Triad of personality.

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